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ABSTRACT

Intended to serve as a resource guide on traumatic brain injury for rehabilitation practitioners, the book's 10 chapters are grouped into sections which provide an introduction and examine aspects of evaluation, treatment and placement planning, and unresolved issues. Chapters have the following titles and authors: "Scope of the Problem" (Marilyn Spivack and Mark Balicki); "The Nature of Head Injury" (Thomas Kay and Muriel Lezak); "Problems Needing Solutions: A Consumer and Family Perspective" (Jeffrey S. Smigielski and Audrey L. Nelson); "The Neuropsychological Evaluation" (James Malec); "Specialized Evaluations" (Jeffrey S. Smigielski and James Malec); "Vocational Evaluation of Persons with Traumatic Head Injury" (Dale F. Thomas); "Vocational Assessment: A VR Counselor's Perspective" (Jean Balutanski); "Preparation for Placement" (Dana S. DeBoskey and Robert W. Krollman); "Placement Options and Processes" (Robert W. Krollman and Dana S. DeBoskey); and "Unresolved Issues in the Rehabilitation and Community-Based Employment of Persons with Traumatic Brain Injury" (Fredrick E. Menz and Dale F. Thomas). Appended are the Glasgow Coma Scale, the Rancho Los Amigos Head Trauma Scale, and profiles of physical and neuropsychological variables. Most chapters include references. (DB)

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TRAUMATIC BRAIN INJURY and VOCATIONAL REHABILITATION

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The Research and Training Center
UNIVERSITY OF WISCONSIN-STOUT

Traumatic Brain Injury and Vocational Rehabilitation

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Acknowledgements

In 1984, the Institute on Rehabilitation Issues (IRI) identified the need for a resource book on traumatic brain injury for practitioners in the field of vocational rehabilitation. At that time, rehabilitation programs, throughout the nation, were being confronted by ever increasing referrals of persons with traumatic brain injury (TBI). However, the practitioner was unable to find helpful information to effectively address the needs and challenges they faced in providing effective services to persons with such a broad array of symptoms and functional handicaps.

The Research and Training Center, at the University of Wisconsin-Stout, accepted the IRI Executive Committee's challenge to develop a resource document for vocational rehabilitation professionals. The IRI University sponsor undertook the challenge by arranging to meet with a small group of knowledgeable people, working in the field, who could develop the topic. The challenge to this group was to translate the highly technical, medical, neuropsychological, and other information and research from several disciplines into a format that could be used by rehabilitation practitioners.

The twelve people in that original IRI Prime Study Group admirably met that challenge. They produced a book that was often quoted, studied, used in short term training, and held by some as a most useful down-to-earth resource document. Their book went through two printings and reached several thousand practitioners in many specialties throughout the rehabilitation community.

The original Prime Study Group was chaired by Marvin Tooman, Ed.D., Iowa Rehabilitation Education and Services and the University Sponsor/editor was David W. Corthell, Ed.D of the University of Wisconsin-Stout Research and Training Center. The members who wrote the initial two drafts of the final document were Peggy Wilson M.S., Speech Pathologist, School of Ed/Communication Disorders, San Francisco State University; Ron Anderson, Ph.D., Department of Special Education, University of Northern Iowa; Walter H. Verduyn, M.D., Schoitz Medical Center, Iowa; Dale F. Thomas, Ph.D., Research Specialist, Stout Research and Training Center; Peter Griswold, Director, Vocational Rehabilitation, Michigan; Robert Krollman, M.S., Mental Health Association of Northern Virginia; Thomas Kay, Ph.D., Coordinator of Head Trauma Research Project, Institute of Rehabilitation Medicine, New York, N.Y.; Joan Luczkow, R.N., Coordinator of Professional Development &

Education, National Head Injury Foundation, Inc.; Muriel Lezak, Ph.D., Dept of Psychology Veterans Administration Medical Center, Portland, Oregon; and Ted Thayer, Director of Independent Living, Texas Rehabilitation Commission.

It was these persons whose insight and skill produced a resource that many persons found helpful in providing quality vocational rehabilitation services for persons who have traumatic brain injury.

Preface

During the Fall of 1984, the Research and Training Center at the University of Wisconsin-Stout, as a University sponsor of the Institute on Rehabilitation Issues, took on the development of a resource guide on traumatic brain injury for rehabilitation practitioners. As indicated in the acknowledgement we were fortunate to have a core of very dedicated and knowledgeable persons on that Prime Study Group. Their efforts, which I had the pleasure of editing, was well received by the field. It was extensively used as a training document both for preservice and in-service training of rehabilitation professionals working with individuals who had loss of major life functions due to traumatic brain injury. Over 14 thousand copies of that first book, written for vocational rehabilitation professionals new to traumatic brain injury, were distributed or sold.

Since 1984, the Stout Research and Training Center (RTC) has completed several large and small scale research projects on different service delivery concerns with persons who are traumatically brain injured. In addition, the RTC conducted Think Tanks on traumatic brain injury and issues in community re-entry which eventually led to the Clearwater Beach conference on "Traumatic Brain Injury and Community Based Employment," February 27-28, 1989. The knowledge of RTC staff members regarding the needs of practitioners, consumers, and family members has grown considerably as a result of their: review of the literature; discussion with practitioner, consumers, and family members; research projects; and training conferences and seminars. Consequently, it was determined that so much new knowledge was available that a new book was necessary.

Also, since 1984-85 significant new information has been developed in the vocational rehabilitation of persons with traumatic brain injury. There has been a number of research projects completed during the past five years along with the emergence of new treatment methods. Also, since that time several new service delivery systems had been established in response to success and failure of old methods. Therefore, the staff of the Stout Research and Training Center felt it more appropriate to bring together a new group of individuals to rewrite the original document rather than reprint the older document for a third time.

The intent was to use the original document as a point of departure, but to reorganize where possible and to add new material where appropriate. Two and a half days of intense discussion and debate produced new outlines for chapters.

It also became apparent that the new book should be organized into sections for ease of reading. This "new" book was a product of those dedicated individuals efforts. While it is an outgrowth of the original text, it is a fresh approach to working with persons who are traumatically brain injured.

Section One, **Introduction** contains three chapters. The first chapter "Scope of the Problem" was written by Marilyn Spivack, founder of the National Head Injury Foundation and Mark Balicki, formerly of NHIF and currently Clinical Supervisor of Rehabilitation Services for Alternative Care in Boston, Massachusetts. For persons new to TBI, it will indicate the true immensity of the "Silent Epidemic." Chapter II, "The Nature of Head Injury" was written by Dr. Thomas Kay, Research Director of the RTC at the Institute of Rehabilitation Medicine, New York, and Dr. Muriel Lezak, of the Department of Neurology at the Oregon Health Sciences University, Portland. It will describe the basics of closed head injury in a way that practitioners and family members can understand the serious consequences of this disability. The third chapter, "Problems Needing Solution: A Consumer and Family Perspective" was developed by Dr. Jeffrey Smigielski, Consultant, Mayo Clinic, Department of Psychiatry and Psychology, Rochester, Minnesota and Ms. Audrey Nelson of the Stout RTC and consumer activist. This chapter will review for the reader what it is like to cope with closed head trauma and some of the problems encountered by consumers and their families.

Section Two, the **Evaluation**, is made up of four chapters. Chapter 4, "Utility of the Neuropsychological Evaluation" was written by Dr. James Malec, Department of Psychology, Mayo Clinic, Rochester, Minnesota. It will indicate how a neuropsychologist is trained what questions they can answer. The next chapter in this section, "Other Specialized Evaluations," was developed by Drs. Jeffrey Smigielski and James Malec of Mayo Clinic. It briefly reviews the significant role other specialists may play in the evaluation of persons with traumatic brain injury. Chapter 6, "Vocational Evaluation of Persons with a TBI" was developed and written by Dr. Dale Thomas, Research Scientist with the Stout RTC. His chapter reviews the insight and role of formal vocational evaluation in the development of a vocational plan. Chapter 7, "Vocational Assessment: A VR Counselor's Perspective," was written by Jean Balutanski, M.A., Supervisor of Vocational Services Department, Rusk Institute of Rehabilitation Medicine, New York. Her chapter takes an assessment point of view indicating the need for counselor flexibility in delivery of services.

Section Three, **Treatment and Placement Planning**, is made up of two chapters. Chapter 8, "Preparation for Placement" was developed by Dana DeBoskey, Ph.D., Clinical Director, DeBoskey and Associates of Tampa, Florida and Robert Krollman, M.S., Unit Supervisor, Head Injury Project Comprehensive Employment Services, Virginia Department of Rehabilitative Services. It reviews the typical and new treatment methods being used with

persons with this disability. Chapter 9, "Placement Options and Processes" was written by Robert Krollman and Dana DeBoskey. It will suggest methods that are practical and time tested in making the transition to the world of work.

The final section contains one chapter, "Unresolved Issues." It was developed by Dr. Fredrick Menz and Dr. Dale Thomas, University of Wisconsin-Stout RTC, from input from the national conference on "Traumatic Brain Injury and Community-Based Employment" sponsored by the Research and Training Center, University of Wisconsin-Stout in association with the National Head Injury Foundation, Inc. As with any new and emerging field, there are many unresolved issues that need to be addressed.

It was the above mentioned dedicated professionals who made this book possible. It is our sincere hope that their efforts will, in some small measure, help persons with traumatic brain injury lead more productive and full lives within their community.

From inception, it was our aim to produce a practical book that would be of interest to a wide range of individuals. Consequently, chapter outlines were developed to provide information that will be of value to beginners in rehabilitation while holding the interest of individuals who have years of experience in rehabilitation but only tangential knowledge of the multiple functional losses that may be present in TBI. It was also written to inform the consumer, family members, and consumer advocates as to the range of information necessary, specialist who may be involved, and the potentially long and intricate process that may need to be followed. Further, while this book contains current best practices, methods, and processes of rehabilitation for persons with traumatic brain injury, it is fully realized that new methods and procedures will be developed over the next several years.

Section I

INTRODUCTION

Chapter 1

SCOPE OF THE PROBLEM

Marilyn Spivack
and
Mark Balicki, M.Ed.

Marilyn Spivack and her husband founded the National Head Injury Foundation (NHIF) in 1980. They developed NHIF out of frustration at the lack of programs and service for their daughter who sustained lifelong disability after traumatic brain injury. From 1983 to 1990, she served as President and Chief Executive Officer of that organization which grew to 43 state associations and over 375 chapters. As a recognized and spirited advocate, Mrs. Spivack has served on many advisory boards, task forces, and committees focused on TBI. She has received many national awards from professional associations for her contribution to the field of TBI rehabilitation. Recently she resigned her NHIF position and formed a new corporation where she will continue advocacy activities as well as consultation in the development of programs and services for people with disabilities following neurotrauma.

Mark Balicki, R.P.T, M.Ed. is currently the Clinical Supervisor of Rehabilitation Services for Alternative Care in Boston. Mr. Balicki has applied his background in physical therapy and education to various aspects of rehabilitation for persons with head injury. Prior work experience includes Director of Education and Professional Services at the NHIF. There his focus was curriculum and program development. He has extensive case management training and experience with the Greenery Rehabilitation Center, New Medico Systems and as the founder of Pangea, an education and advocacy concern.

INTRODUCTION

As we enter the last decade of this century it is inconceivable that "society" has not understood the enormity of the injury epidemic in this country - two million traumatic head injuries per year, with 500,000 requiring hospitalization, and 75,000 to 100,000 deaths per year. Because of this lack of understanding, society has not come to grips with the catastrophic aftermath of serious injury on the individual, family, and his or her community.

Furthermore, it has not fully recognized the broad impact injury has on the health care and human service systems and their related costs. Injury in America has and continues to plague society. Historically throughout the world, injury and infectious disease have been the major cause of death and disability, not only of the young, but of the total population. Since the discovery of sulphur drugs in the thirties and penicillin and other antibiotics in the forties and fifties, infectious disease has been conquered as a major cause of mortality and morbidity in this country and the industrialized countries of the world. Certainly, people still die of infectious disease but mainly as the terminal event of the aged and of those with acute severe illness.

In the past decade, infectious disease has come to the forefront again as the HIV epidemic has rapidly risen to a major public health concern. We cannot disagree with the concern as the projections for 1993 are that 450,000 Americans will be diagnosed with AIDS and the anticipated death rate among them will be as high as 60 percent. This area of concern has risen to priority status through public attention and media exposure. Organized advocacy born of fear, anger, and grief caused both the private and public sectors to respond with needed resources for public education, research, clinical treatments and a range of services. We bring this to your attention in this chapter to compare the recognition of AIDS, as an epidemic, to an epidemic over the centuries.

Traumatic brain injury (TBI) is the major cause of death and disability for persons under age 35 and continues to rapidly rise since the seventies as fatalities have decreased and survival rates dramatically increased. The fact that TBI overwhelms any other single cause of death and disability to all under age 35 needs constant restating!

We as a society can immediately make a difference. We can reduce this waste of our most precious resource - our young people - by the use of **prevention**. We do not need to spend billions searching for the primary cure for the cause of the disease. Prevention is within our reach. However, until society takes a proactive stand and demands every realistic measure of prevention, we as a society, must deal with the aftermath of injury as it impacts our families, communities, schools, and workplace. Society must find the

resources to provide the needed programs and services in a coordinated and appropriate delivery system. Society - **we as a people** - must demand the public policy which focuses on the reduction of injury and disability as a national priority - as we did with the AIDS epidemic.

Just ten years ago, service providers, physicians, rehabilitation specialists, insurers, federal and state agency administrators knew little or nothing of the disabilities caused by traumatic injury to the brain. Because of the organized advocacy efforts spearheaded by the National Head Injury Foundation (NHIF), the past decade has been one of enlightenment, response, planning, research, training, program development, and even public policy change. Funding streams from both the public and private sectors have started to slowly flow to underwrite development of programs and for patients and client services.

New rehabilitation concepts and disciplines have moved toward maturation and effectiveness as TBI medical management and rehabilitation are now subject to scrutiny of standards of care and emerging management ethics. Demands for quality assurance are coming from many sources including providers of care, third party payers, and consumers.

The decade of the 90s will encourage and foster the inclusion of people with disabilities and their families in decisions regarding their programs in rehabilitation and habilitation. There will be a concerted effort to educate people with disabilities and their families of their rights under the laws which impinge on their education, rehabilitation, and basic civil rights.

Consumers and their families are beginning to understand and support empowerment issues and their rights to participate in the planning of their education and/or rehabilitation program. Without their active participation education and rehabilitation cannot be as successful and effective.

The need for case management for catastrophic illness and disability has been well documented. The role of the case manager is now recognized as pivotal in the coordination of an effective rehabilitation process. Unfortunately, at this time few people have access to professional case managers. In the management of TBI, many family care givers have assumed the role of activists supporting the need for case coordinators. For the survivor, without benefit of professional or family case managers, the future is bleak. The individual with severe TBI cannot function without guidance, support, and structure. Often times these supports may be needed for many years until independence is reached. Tragically, there is still a larger percentage of people who fall into the unserved and underserved category than the fortunate people who have the benefits of accessing the head injury systems that exist mainly in the private sector with case management services in place.

Because these individuals have extraordinary sources of funding for medical and extended rehabilitation, they have the educational and prevocational services absolutely necessary to enter a traditional vocational rehabilitation program including supported employment. There is little doubt that the rehabilitation and post acute rehabilitation programs have now begun to catch up with survivors of severe, moderate, and mild head injuries, if the programs have funding.

Federal and state agency administrators of all human services are deeply concerned about the impact of this population who are surviving. More and more persons with TBI are turning to them for extraordinary assistance, often for extended medical rehabilitation services and expensive technologically assistive devices. However, the level of appropriation for federal and state programs have not risen accordingly to meet the new demands created by these new populations.

In reaction to increased demand of people with complex disabilities, TBI can set the varied agenda for tomorrow's model of what the rehabilitation program needs to address. The authors support the federal administrators requests for: research, data collection and demonstration projects, models for effectiveness of service delivery, methodology for improved outcome measures, and improved diagnostic testing and evaluation. We encourage both federal and state agency administrators to be receptive to collaborate and coordinate efforts with sister agencies as so many needs must be met. No single agency can address them all programmatically or economically. Turf issues create needless barriers for the client, which insures failure for the agency, counselor, and clients.

In spite of the challenges ahead, we do have hope and are encouraged. For example, over the past five years, the vocational outcome for some survivors of TBI (mild to severe) in competitive and noncompetitive environments have shown that success can be achieved. Success does not come quickly, easily, or without considerable energy, expertise, funding, and the tenacity of many. Within the 600+ programs in the NHIF Directory of Resources, there are programs developed and administered by specialized professionals who are **disproving** that vocational outcomes for persons with TBI are grim, bleak, and unrealistic. The grim and bleak approach breeds failure for all of us, the bleakness lies in the lack of resources in the public and private sectors. Restrictive regulations; inflexibility of standards, traditional models, and language of regulations; lack of training; technical assistance; barriers of attitudes and environments are still obstacles. We must look at these obstacles as temporary roadblocks in the path of our future. We ask you, as the gatekeepers of our last phase in the system designed to return to greater independence, to be open, creative, flexible, to help eradicate known and yet unknown obstacles in our path of recovery after a TBI.

This book may be the first of many publications you can access for information and further education in TBI. Clearly the lack of education in TBI management in all disciplines has caused families added frustration, grief, and impaired the process of restoration of function. Understanding the problem, begins for the client when they first present him/herself with an application for services. Their medical records may not correctly identify the cause or describe their significant array of disabilities. The impact on vocational outcomes may take a positive or negative course depending on what you do at that point. An extensive background on TBI is necessary for the success of your clients. You need to know who to ask for assistance in gathering information regarding the client's background and history. To ensure a measure of success, it is critical for counselors assigned to clients with TBI to have a knowledge base which includes understanding of the neuropsychological and neuropsychiatric problems which may or may not have been identified by previous treating clinicians and counselors. Too many people with TBI have failed, not because of their disabilities and impairments, but because of the lack of knowledge and expertise of the treating professional. Therefore to ensure some measure of success for both counselor and client, it is critical for counselors to have a base of training and understanding to better understand the disability's visible and invisible attributes.

It is important to note the "recovery" after TBI is a very lengthy process, rarely accomplished in months, more likely years, if environmental structure and supports are provided. There will be a slow improvement in function, memory, behavior, and cognitive skills. There are many who doubt that progress continues but they only have the benefit of time limited research. As a family member and a professional who has had contact with hundreds of persons with TBI and their families over the past decade and beyond, the senior author recognizes that recovery of function is very possible within appropriate settings and enhanced by supportive relationships.

Return to competitive employment is the ultimate we can expect. But expectation of such an outcome is not always realistic for those people who have sustained severe TBI. Return to alternatives to competitive employment can be fulfilling and meaningful. Creating opportunities for growth, to improve functioning, for reaching an optimum level of independence, are goals worthy of accomplishment.

CASE STUDY

Michael, age twenty two, worked as a mechanic at a neighborhood garage after attending technical college with the aid of the state vocational rehabilitation agency. He had been a vocational rehabilitation client in high school because of a combination of a mild learning disability and a short leg as a result of a early teenage accident.

Life was routine until one day at the shop when Mike was hit on the head by an engine block. He didn't lose consciousness, but it was obvious that he was dazed. Mike was taken to the emergency room for tests and stitches in his scalp to close a small gash. At the hospital he received a routine examination for neurological damage, received a clean bill of health from the physician in the emergency room, but was held overnight because he felt dizzy and didn't respond too clearly.

In the morning he had a nagging headache, knew the physician's name, the date, what happened in the emergency room, and wanted to go home. Mike was sent home to rest, told he had a mild concussion, and that he would have a headache for a day or so. He already had a headache, could barely remember what happened that morning at work, but otherwise felt OK. The next day was Friday so he stayed home because he still didn't feel good and had a severe headache which he treated with aspirin.

Over the next few weeks, Mike's co-workers, his family and his girlfriend noticed some changes in his personality. He complained about everything. He frequently had temper outbursts over small disagreements or problems. Nobody could do anything right according to Michael. Finally, after several reprimands, his boss let him go. Mike had thrown a tool at one of his co-workers who was making "too much noise."

Mike's family also saw him become more of a problem now that he was just "loafing." He had no motivation, no initiative and seemed to be irritated by the most trivial things. Mike went on a few interviews, but it seemed to his father that Mike had an excuse for every offer falling through. "Not enough pay," "that boss is a jerk," "this is just a hassle." Mike's father drew the line. Mike either went back to see the vocational rehabilitation counselor downtown or he was out of the house. Reluctantly, Mike made an appointment with the local vocational rehabilitation office.

Ellen, a well qualified VR counselor, took the standard history from Mike. It did seem odd to Ellen that here was a talented, able young man who had fallen off track. Substance abuse didn't seem to be the culprit, but it sounded like it was blossoming into an issue for Mike. He was spending many evenings in a bar "with my friends and lifting a few cause home is a hassle." There just weren't any other glaring stressors that gave Ellen a clue as to the real problem. Her initial impression was a simple case; some vocational counseling, teach Mike how to conduct himself in an interview, suggest some potential employers, and he would easily find a job.

As the weeks went by though, Ellen saw a pattern developing. Potential employers told Ellen that Mike had either blown his first trials on the job, or worse, hadn't even made it to the interview. Key words kept showing up: no concentration, forgetful, destructible, impulsive, unreliable, temperamental.

Ellen wondered about his learning disability, but his academic records indicated none of the key words the employers were now mentioning. In school he had been described as hard working, likeable, easy to work with, and as a student "who sticks with a problem until it is solved."

At a loss, Ellen asked Mike to comply with a request for a medical and psychological exam. More time was lost trying to get Mike to keep his appointments, but finally he completed all the tests.

The current general medical exam and neurological tests were no more enlightening than Mike's old records. Although the old records contained evidence that there was a concussion, the records stated a full recovery was indicated, with no apparent memory loss or immediate deficits of significance. The recent CAT scan was normal, as were all other systems reviews. The clinical psychologist confirmed that Mike did have attention and concentration problems and his IQ score was slightly lower than previously recorded by the school psychologist (testing done when he was 17). His memory scores were not depressed, though, as compared with his school records. The current tests did indicate clinical depression and based on this, the psychologist recommended ongoing therapy. Ellen worried about Mike's intentions to comply with these recommendations and tried to rally his family for support.

It became clearer that Mike was becoming isolated. His family was about to wash their hands of him. His girlfriend was no longer in the picture and Mike continued to complain. Even his friends at the bar were not interested in spending time with Mike.

After a month of counseling with his psychologist and continued attempts by Ellen to find work for Mike, he announced that he was not going to come in any more. Confused and frustrated because Mike wouldn't even return her calls, Ellen closed the case.

NEED

The above scenario, in one form or another, will be familiar to virtually all vocational rehabilitation counselors. The traumatically brain injured person, even those with mild losses, is one of the most difficult and frustrating clients with whom to work. As the demographics indicate, many of these individuals are young enough that counselors find themselves looking for appropriate habilitation and rehabilitation programs. The client typically has little or no work experience to draw upon when trying to meet the re-entry challenge.

Some vocational rehabilitation agencies have reported up to 90 percent failure rate with their clients who have sustained a traumatic brain injury. Other research indicates that only 13 percent (Peck, Fulton, Cohen, Warren, & Antonello, 1984) to 29 percent (Brooks, McKinlay, Symington, Beattie, &

Campsie, 1987) returned to full time employment. Roessler (1990), questioned 1,052 persons seven years after their head injuries and found that over 70 percent were unemployed and reported multiple symptoms affecting their vocational and social functioning. "While they considered employment services very important, respondents were not satisfied with the availability and quality of specific preparation, placement, and postemployment services" (p. 2). Perhaps closer study of failures and success would help us understand the causes and environments which produce these effects.

There are multiple challenges facing rehabilitation counselors. These challenges can be overwhelming when viewed from a total perspective. There are four distinct areas in which these challenges fall.

1. Lack of training and education in TBI for vocational rehabilitation counselors; lack of perceived administrative support; and regulations which are not specific to TBI (i.e., closure rulings inappropriate to the multiple functional loss caused by TBI). These issues frustrate and discourage VR personnel from working with these very challenging clients.

2. Incomplete or poor documentation and evaluation of clients medical and rehabilitation history, qualified personnel for assessment, and predictable prognosis. The exception occurs when clients have access to dedicated head injury programs.

3. Lack of opportunities in prevocational and vocational training programs, which are still operating out of traditional models which focus on populations with mental retardation, mental illness, and physical disabilities.

4. Lack of community support systems providing activities of daily living skills and community re-entry training opportunities to transitional and independent living. Programs where there are trained personal care attendants, accessible transportation, and the lack of eligibility for funding to access these services if they are available.

Over the past five years, an effort to address these issues has been made by RSA and state VR commissioners and directors. They have supported the TBI initiatives, which are to develop enhanced TBI education and training service. These initiatives are well defined in the NHIF/OSERS agreement signed in May 1985. Furthermore, the twelfth Institute on Rehabilitation Issues (IRI) study of TBI (Corthell & Tooman, 1985) as well as the many books and articles published over the past few years have contributed to a growing body of knowledge about issues in rehabilitation of persons with traumatic brain injury.

The broadening of understanding within the rehabilitation system created some meaningful progress, but with progress there are new sets of challenges and needs. The multiple needs of persons with traumatic brain injury have been

clearly identified by academicians, clinicians, the families survivors, and by the federal interagency task force on head injury. Some of these are as follows:

1. Classification and clarification of the traumatic brain injury diagnosis.

2. Understanding the significance of mild head injury in vocational rehabilitation along with the importance of the counselor understanding the basic consequences of neuropathology and neurophysiology of TBI as well as the neuropsychological problems.

3. Where does the VR counselor turn for neuropsychological assessment and evaluation? How great is the impact on case planning when testing is, of necessity, determined by cost and geographic constraints?

4. What are the impacts of lack of resources in rural and urban areas which lack comprehensive services for clients with head injuries? Although there are greater options each year there are still significant gaps in rural areas and in some urban regions.

5. What can the rehabilitation systems provide for clients with TBI who have diversity of disabilities, functional losses, and handicaps? For example, it is known that the individual with mild head injury presents a totally different set of needs and requires different service from the client with a more severe set of complex problems.

6. What will be the impact of the current rules and regulations regarding supported employment on the success rate of clients with TBI? In some areas the supported employment regulations do not meet the needs of the client, therefore, success will be diminished or worse the client will fail.

7. For the more severely disabled is there another road to travel - identifying the system of services needed to support the client in pursuit of vocational independence (i.e., behavior management, community living skills, social integration, transportation, financial management assistance). A full range of services, in a coordinated system, is required to meet the needs of these individuals.

8. Systems created for clients with mental illness and mental retardation should be more comprehensive and responsive if they are to serve the community re-entry for persons with TBI.

9. It may be time to give the rhetoric of interagency collaboration a vigorous shot of encouragement, administrative blessing, and fiscal resource management. As advocates have said, TBI is not the total responsibility of any one agency financially or programmatically. Perhaps it should be because of the numbers of persons in need and the high costs. But for the

foreseeable future, the need for cooperative effort between agencies and funders is clear.

Specialized curricula for rehabilitation counselors is lacking or incomplete; and administrators have been at a loss to provide the information and training to their staff to enable them to handle the problems more effectively. As indicated in the Interagency Head Injury Task Force Report (HHS, 1989), "Continuing education that addresses the unique deficiencies of the head injured population should be stressed. Families, counselors and individuals involved in all parts of the educational system should coordinate their efforts to ensure that intervention is available, when necessary" (p. 18).

This book was written in response to the need for a document to help the vocational rehabilitation counselor identify, understand, and deal more effectively with clients who have been traumatically brain injured. It should serve as a guide to in-service training for counseling and other human service staff working with persons who have mild to moderate head injuries.

DEFINITION

Traumatic brain injury is often referred to by a variety of other terms. Head injury, brain injury, and head trauma, are commonly used to describe the person with traumatic brain injury and, generally speaking, all of these terms reference the same population. For purposes of clarity and consistency, traumatic brain injury (TBI) will be used to describe the population that is the focus of the publication.

> Traumatic brain injury is an insult to the brain, not of a degenerative or congenital nature, caused by an external physical force. That force or blow may produce a diminished or altered state of consciousness, which results in dysfunction of cognitive abilities and/or physical functioning. These impairments may be either temporary or permanent and cause partial or total functional disability or psychosocial maladjustment.

A PROFILE

The typical person who becomes traumatically brain injured is male, between the ages of 15 and 24 and most likely sustained his injury in a motor vehicle accident while not wearing a seat belt. Studies also indicated that an alarming number of these accidents involved substance abuse. However, there are significant numbers of persons who received their injury during the formative years (childhood or pre-adolescent) who become young adults entering the vocational rehabilitation system who will need transitional and adult services.

The severity of resultant long-term deficits can be difficult to predict as

these will vary greatly depending on the nature, location, and extent of the injury. Therefore, the use of words such as "typically" when describing a person with traumatic brain injury can be misleading. However, common deficits in the areas of physical function, cognition, communication, psychosocial function, and health will need to be addressed as return of function occurs.

All too often, when a person with TBI is deemed medically stable, they are released from the care of the medical community without referral to other agencies. Consequently they and their family care givers, lack access to extended rehabilitation services and/or prevocational and educational services. Lack of these services becomes a major barrier toward community re-entry. Also not uncommon - misunderstanding, misdirected referral, or misdiagnosis can follow and be of serious consequence. Families unaccustomed to the human services systems are not aware, comfortable with, or educated as to how to work with agencies as a positive advocate or member of a larger team.

A person, who has sustained a traumatic brain injury, may present problems in mobility, medical complication (i.e., seizures), speech, memory, and social behavior. As a consequent of functional handicaps, they are often treated as persons with mental retardation, learning disabilities, and/or as having a psychiatric problem. Problems are frequently compounded by the fact that many persons with TBI are unaware of their deficits even after they have been clinically identified.

DIMENSIONS OF THE PROBLEM

Because of the variance of epidemiology studies and lack of a registry, definitive data regarding the incidence and prevalence of TBI are difficult to establish. Several issues have contributed to this problem (e.g., inconsistent definitions of TBI, lack of standardized reporting mechanisms), yet the studies indicate that traumatic head injury is occurring in the United States at a staggering rate. For example, the Interagency Head Injury Task Force Report (HHS, 1989) states,

> Current data indicate that someone receives a head injury every fifteen seconds in the United States. A conservative estimate puts the total number of such injuries at over two million per year with 500,000 severe enough to require hospital admission. 75,000 to 100,000 die each year as a result of TBI and it is the leading killer and cause of disability in children and young adults. Among those who survive, TBI results in 5,000 new cases of epilepsy each year and is the principle cause of permanent brain damage in young adults. Related medical and legal bills can become astronomical, often leaving families with near or total financial ruin. The economic costs alone approach $25 billion per year. (p. 1)

The first national study of the incidence of TBI was conducted by William F. Caveness in 1979. He estimated that each year four to five per cent of the U.S. population sustained head injuries. In the years that followed, stricter diagnostic criteria were used and, estimates of 0.2 percent to 0.3 percent were reported. However, it is now understood that some criteria, such as hospitalization or loss of consciousness, if absent, cannot rule out long-term consequences of what may appear to be a trivial head injury at the time of the incident.

Kraus et al., (1984) conducted a study to estimate the incidence of TBI in San Diego County, California in 1981. As illustrated in Table 1, the rate of TBI is quite high even though these numbers do not include persons who died prior to admission not persons who were held for observation and released without TBI as the diagnosis of record. In Table 1, mild, moderate and severe relate to the Glasgow Coma Scale, a scoring system used to measure impaired consciousness as well as other criteria such as length of hospital stay.

TABLE 1
Number of Persons With Brain Injury and Incidence Rates Per 100,000 Population - San Diego County, CA, 1981

	Number of Cases	Incidence/100,000/Yr.
Admitted to Hospital	2,972	160
With Severe Brain Injury	266	14
With Moderate Brain Injury	271	15
With Mild Brain Injury	2,435	131
Total Brain Injury	3,358	180

The financial cost of incurring a TBI, both to the individual and to society, is potentially extremely burdensome. Extrapolating figures from the National Head and Spinal Cord Injury Survey, a twenty-five-year-old male with a severe head injury in 1974 could cost society an estimated 4.9 million dollars during his lifetime. A paper by the Interagency Head Injury Task Force (Health and Human Services, 1989), indicates:

Primarily a disability of the young, traumatic brain injury takes a

> tremendous toll on society. The economic costs alone approach $25 billion per year. This figure includes the total direct and indirect costs of medical treatment, rehabilitative and support services and lost income. A survivor of a severe brain injury typically faces 5 to 10 years of intensive services at an estimated cost in excess of $4 million. Paradoxically, research into the control and treatment of traumatic brain injury receives less than one penny of every Federal dollar spent on medical research. (p. 7)

FURTHER STUDIES

Table 2, which summarizes a number of TBI studies, provides more details about who suffers most from TBI. It can be seen that traumatic brain injury affects young adults with peak incidence consistency in the late teens and early twenties. More specifically, it is largely young men who are at risk with ratios of male to female incidence ranging from 2:1 to 2.8:1.

Finally, except in high-crime urban settings (where assaults predominate), about one half of traumatic brain injuries occur as a result of motor vehicle accidents involving a driver, passenger, or pedestrian. Besides being the single greatest cause of TBI, there is also evidence (Kalsbeek et al., 1980) that TBI resulting from motor vehicle accidents is more severe and costly than TBI resulting from other cases (e.g., falls, blows to the head). The various causes of TBI are graphically represented in Table 3. This data is taken from a study (Kraus et al., 1984) which is confirmatory of most reports on the distribution of causes.

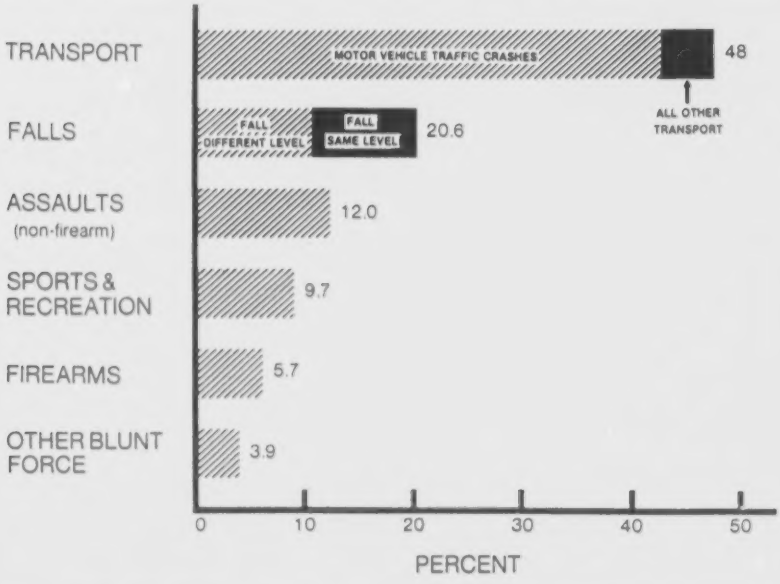
In conclusion, perhaps the best perspective on the extent of the TBI problem, especially from a rehabilitation point of view, comes from a comparison of the numbers of TBI and spinal cord injuries. Spinal cord injury, as a disability group, has received considerable attention in the field of rehabilitation for years. Yet the National Head and Spinal Cord Injury Survey (Kalsbeek et al., 1980) estimated that while spinal cord injuries occur at the rate of five per 100,000 persons each year, traumatic brain injury occurs at the rate of 200 per 100,000 persons each year. Despite the allocations of attention and resources in the past, there are potentially 40 head injuries for each spinal cord injury. Emergency response and medical advances have helped save the lives of persons sustaining traumatic brain injuries; it is now in the hands of rehabilitation professionals to deal with TBI as a long-range and extensive problem. It is estimated, that due to improved survival rates after severe head injury since the late 1970s, there may be 1,500,000 Americans under age 45 with significant disabilities which interfere with their ability to reenter their communities independently.

TABLE 2
Summary of Selected Characteristics Describing the Incidence of Head or Acute Brain Injury in U.S. Populations

STUDY POPULATIONS AND DATE	INCIDENCE RATE PER 100,000 POPULATION	MALE TO FEMALE INCIDENCE RATIOS	BLACK TO WHITE INCIDENCE RATIOS	SEASON OF PEAK INCIDENCE	AGES OF PEAK INCIDENCE	TRAFFIC TRANSPORT	CAUSE[5] OF INJURY		
							FALLS	ASSAULTS	FIREARMS
United States Population (2)									
Head Injuries, 1974	200[1]	2.1	1.1	Summer	15-24 yrs.	49%	28%	no report	no report
Olmsted County, MN (1)									
Head Injuries, 1965-1974	193	2.3	no report	Summer	15-24 yrs.	47%	29%	4%	3%
San Diego County, CA (3)									
Head Injuries, 1978	295[2]	1.3 - 2.8[4]	no report	Spring	15-19 yrs.	53%	30%	11%	no report
San Diego County, CA (7)									
Acute Brain Injuries, 1981	180	2.2	no report	no report	15-19 yrs.	48%	21%	12%	6%
Bronx County, NY (4)									
Head Injuries, 1980-81	249[3]	2.1	1.3	Summer	20-29 yrs.	31%	29%	-----33%-----	
Charlottesville, VA (6)									
Head Injuries, 1978	208	2.4	1.5	Summer	15-19 yrs.	55%	20%	-----11%-----	
Chicago, IL (5)									
Head Injuries, 1979-80									
Inner City Black	403	2.5		Spring	25-34 yrs.	31%	20%	34%	6%
Suburban Black	394	2.8	approx. 2	Spring	0-1 yr.	32%	21%	24%	2%
Suburban White	196	2.3		Spring	0-1 yr.	39%	31%	10%	0%

[1] Excludes non-hospital deaths
[2] Excludes gunshot but includes non-residents
[3] Age-adjusted to 1980 U.S. population
[4] Range of ratios by age
[5] Definitions of cause vary among studies

TABLE 3
Percentage Distribution of Persons With Brain Injury by Major Categories of External Causes



PURPOSE OF THIS DOCUMENT

It is the intent of this publication to provide rehabilitation practitioners with a basic introduction to the nature of TBI and the resultant deficits observed. Because brain injury rehabilitation is a relatively new field, it is important that you understand some of the myths that have already developed about recovery and interventions.

This document will also provide you with some guidelines for realistic service planning. Traumatic brain injury rehabilitation services are developing across the county at a fast pace - each addressing numerous phases in the continuum of care, and there may be specialized programs available to clients in your area. For example, in 1980 there were only 14 programs serving persons with TBI. Each year the National Head Injury Foundation (NHIF) publishes the National Directory of Head Injury Rehabilitation Services. Programs have developed at an impressive rate, ranging from coma management to vocational rehabilitation and community re-entry transitional programs. Most are within the private sector, but there are expanding program opportunities

within non-profit organizations, funded by state agencies, social service organizations, and grassroots movements. The NHIF Directory in 1990 lists over 600 programs in all categories.

Information, team building, creative strategies, employer/employee education and community networking, housing and transportation are needed to help insure successful job retention and growth. It is through a broad effort of many professionals in varied disciplines, along with families that a commitment to quality of life will be possible for survivors of TBI. This publication should provide you with enough information to help you realize that the traumatic brain injury case is not a hopeless one. It is through applying this information to the total rehabilitation process that vocational counselors will better identify and serve persons with TBI.

Consumers and significant others, including parents and spouses, are increasingly hopeful about the future for family members with traumatic brain injuries. The prospect of improved quality of life has increased because of more positive outcomes based on case histories of persons fortunate enough to have access to the state of the art programs from: early trauma-care; acute medical management; acute and postacute rehabilitation; community re-entry support programs and systems; and quality vocational rehabilitation services. A more productive outcome and cost effectiveness are assured when case management within the service system is properly administered and well coordinated with a family support system.

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Chapter 2

THE NATURE OF HEAD INJURY

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and
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Dr. Kay received his Bachelor's degree in English Literature from Dartmouth College in 1972, and his Master's degree in English Literature from the University of Rochester in 1974. His Ph.D. in Clinical Psychology was awarded from Emory University in 1982. He did his clinical internship at the University of Washington Medical Center in Seattle and a Post-doctoral fellowship in Pediatric Psychology at New York University Medical Center. Since 1983, Dr. Kay has served as Coordinator of the Head Trauma Research Project at New York University Medical Center, where his duties have included teaching and clinical research. He is currently Director of Research of the N.Y.U. Research and Training Center on Head Trauma and Stroke. In addition, he maintains an active private practice with neurologically impaired clients and their families; is active with the National Head Injury Foundation; and has published in the area of traumatic head injury rehabilitation.

Dr. Lezak is well acquainted with the neuropsychological consequences of head trauma through both research and many years of clinical practice and supervision. She has written and lectured extensively throughout the world on such different aspects of TBI as: patterns of memory deficits; executive dysfunctions; psychosocial problems; and behavioral alterations of the patient, family concerns, and family counseling. She is currently involved in the development of the Head Trauma Clinic at the Oregon Health Sciences University.

What essentially distinguishes the rehabilitation needs of the head injured client from those of clients with primarily physical handicaps (e.g., spinal cord injuries, amputees), is the fact that damage has occurred to the brain, with the result that cognitive, emotional, and behavioral processes are permanently altered. To plan realistically and to implement a program of rehabilitation for a head injured client requires at least a rudimentary understanding of what has happened to the brain, and how these changes affect the totality of a person's behavior. Until these notions are grasped, there is the danger that the head injured client will be treated as a person "recovering" from a physical problem which time and good medical treatment will heal. This assumption may lead to unrealistic plans for return to home, friends, school and/or work, and consequently frustration and failure. It is the purpose of this chapter to describe the nature of head injury in such a way that its unique characteristics will become apparent, so that a rational, informed plan of rehabilitation can be established. [1]

BRAIN DAMAGE AND PROMINENT RESIDUAL IMPAIRMENTS

Traumatic Brain Injury (TBI)

The phrase "head injury" is commonly used (and misused) in a variety of ways. In its narrowest sense (the sense used here), head injury refers to damage to the brain caused by external mechanical forces applied to the head. In its broader sense, head injury is (mistakenly) used to include stroke, encephalitis, aneurysm, anoxia, tumor, and various other internal events that can lead to brain damage.

While head injury implies some degree of damage to the brain, head injury is not the same as "brain damage." Brain damage can take many forms, and occur at any point in the life cycle from conception to old age. Genetic abnormalities can result in the development of a fetus whose brain never forms normally. The nutritional and biochemical environment in the uterus, or events at the time of birth, can lead to the birth of an infant with varying degrees of brain damage. Later in life, normally developing persons can acquire brain damage either because of something that occurs within their brain (e.g., blockage or bursting of a blood vessel, growth of a tumor), or because of some external insult to the brain (a blow to the head rendering one unconscious, penetration into the brain by some object). In older age, brain damage may

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[1] NOTE ON REFERENCES: For ease of readability, no attempt is made to provide references to document each piece of information as it is introduced in this chapter. A comprehensive and annotated reading list is provided at the end of the chapter for persons wishing to explore these ideas in more detail.

result from alterations in brain substance that are self-inflicted (drug or alcohol) or due to degenerative processes (e.g., Alzheimer's disease).

In this book, the focus is on only one of these types of damage, namely traumatic brain injury that results from trauma to the head. By this is meant damage to the brain, temporary or permanent, that results when the head is hit, strikes a stationary object, or is shaken violently (as in some whiplash injuries). The brain itself may or may not be penetrated from the outside. When it is, as in the case of a bullet wound, the injury is called a penetrating, or open head injury. Closed head injuries result when the brain itself is not externally penetrated. Usually, some period of unconsciousness results from the trauma to the head. However, there are individuals who suffer a blow to the head, do not loose consciousness, and still show signs of TBI.

Traumatic brain injury differs from other types of brain damage in a number of important ways. First, it is damage acquired by a person in the course of what may well have been normal development. Second, it occurs suddenly, leaving the person significantly changed immediately after the injury. Third, unlike tumors, strokes, or even penetrating head injures, closed head injuries usually result in brain damage that is diffuse, or widespread; it is not usually confined to one area of the brain, nor does it typically result in only one specific kind of deficit. Thus, the brain damage is diffuse, impairments are multiple, and many aspects of one's life are effected.

Other chapters in this book will deal with TBI in general. However, this chapter will use closed head injury as the model for discussing acquired brain damage. Closed head injury incorporates essentially all elements of other types of acquired brain damage, the results of which may appear in partial or somewhat different form, and with certain deficits appearing more prominent. Some examples are given below.

Other Types of Acquired Brain Damage

Stroke or CVA (cerebral vascular accident) involves either blockage or hemorrhage of one or more blood vessels in the brain. Stroke patients may suffer physical disabilities (usually hemiplegia, paralysis or weakness on the side of the body opposite the location of the stroke in the brain), low alertness or arousal, and changes in mood, behavior, and personality. In addition, when the stroke is on the left side of the brain, aphasia is often the prominent symptom (language breakdowns that interfere with communication). Conversely, when the stroke is on the right side of the brain, visual perceptual problems, and lack of awareness of one's self, the environment, and other deficits often occur.

Patients whose brain damage is the result of anoxia (lack of oxygen supply to the brain, due to cardiac arrest of cessation of breathing, such as electrocution) often have severe deficits in learning, memory, integration of new

information, judgement, and flexibility of thinking. Longer periods of anoxia may result in profound behavioral changes and regression as well. Other types of diffuse (i.e., not localized to one area) brain damage may present similar pictures with individual variations.

Patients with tumors show specific cognitive and behavioral deficits that depend on the location of the tumor in the brain. Virtually any function can be altered, such as balance, alertness, language, perception, memory, constructional ability, mood, and behavior. Seldom are all of these deficits seen, however, unless there are multiple tumors or a generalized increase of pressure in the brain.

Patients with dementias such as Alzheimer's show specific deficits initially (e.g., memory or language), but gradually or rapidly deteriorate mentally, until virtually all cognitive and behavioral systems are effected.

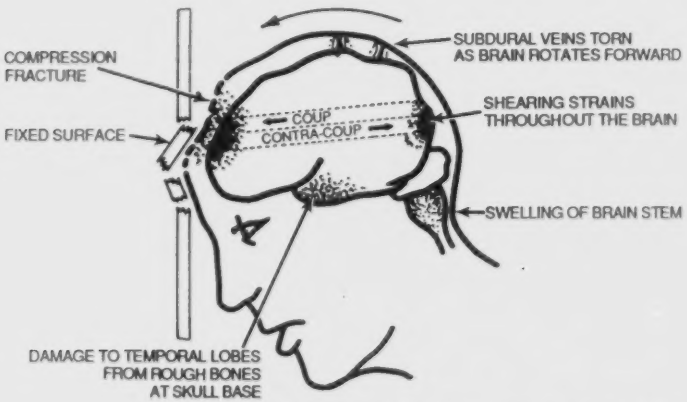
These various kinds of damage to the brain have in common the fact that they usually occur in adulthood to healthy and normal individuals, and result in cognitive and behavioral deficits directly due to damage to the brain. They each, however, have particular "personalities" that differentiate one from the other. Our model of traumatic brain injury is unique in that virtually all of the above manifestations of brain damage may be present in any given individual, and our discussion of the mechanisms of damage, presented below, must account for the full range of deficits.

It is easy for a person to become confused because of the range of cognitive, behavioral, and emotional problems seen in other types of brain damage are also seen in traumatic brain injury. In addition, the implications for rehabilitation, while based on our model of traumatic brain injury, will apply as well to many aspects of the other types of acquired brain damage. In brain damage that is not acquired in adulthood, but is present from birth or early in life, many of the cognitive and behavioral problems are similar, but the rehabilitation issues are quite different. (Such conditions could include, but not be limited to, neurological birth defects, genetic abnormalities, mental retardation, severe neurological learning disability, autism, and childhood onset encephalitis and meningitis.) The main difference in such situations is that the brain damage is present early on, and one's sense of self develops around the deficits, rather than a sudden change of capacities occurring later in life once an individual's personality and sense of self have been formed. One of the greatest struggles in the rehabilitation of persons with acquired brain damage is letting go of an old, established sense of self (including vocational goals and capacities), and learning to recognize and accept an alien new self.

MECHANISMS OF DAMAGE IN TRAUMATIC BRAIN INJURY

The brain itself is a soft mass of custard-like consistency. Its volume cannot be compressed, but its mass can shift and move in relationship to itself when violently disturbed, much like the action of Jello in a bowl that is shaken. This soft brain mass literally "floats" in a bath of cerebral spinal fluid which, in turn, is surrounded by a thick bony container, the skull. The skull is hard and unyielding, although it may bend. The skull is not uniformly smooth on the inside, but rather is marked by bony protuberances near its front where it underlies temporal and frontal lobes. Under normal circumstances, the soft brain floats securely within the vaults formed by the protective bone and membrane of the skull.

The hallmark of a closed head injury is violent and unnatural movement of the brain within the skull. Regardless of whether the head is struck by an object, the moving head strikes an object (such as a dashboard), or violent motion occurs without the head being struck (as in severe whiplash), it is the "shaking up" of the jelly-like brain mass, and its literal "bouncing around" inside the bony skull, that produces the predictable pattern of traumatic brain injury. The mechanical forces applied to the head are called "concussive," and result in three types of primary brain damage, which are illustrated in Figure 1: 1) fronto-temporal contusions (due to damage from rough bones at the base of the skull); 2) diffuse axonal injury (due to "shearing" strains throughout the brain); and 3) coup-contrecoup injury (due to bouncing of the brain off opposite sides of the skull). Secondary damage also may occur, due to hemorrhage, increased intracranial pressure, edema, and cascades of biochemical events that destroy cells.


COMPRESSION FRACTURE
FIXED SURFACE
SUBDURAL VEINS TORN AS BRAIN ROTATES FORWARD
COUP
CONTRA-COUP
SHEARING STRAINS THROUGHOUT THE BRAIN
SWELLING OF BRAIN STEM
DAMAGE TO TEMPORAL LOBES FROM ROUGH BONES AT SKULL BASE

(Used with permission of the Maryland Head Injury Foundation)

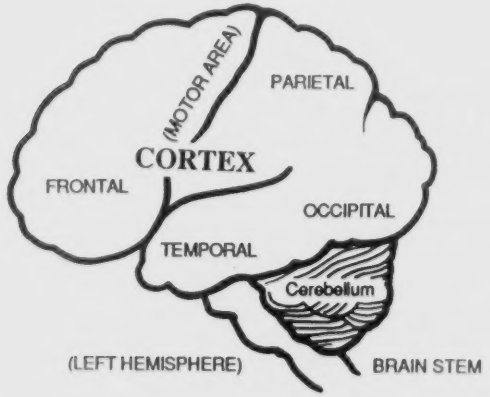
Figure 1. Types of Damage in Closed Head Injury

Brain Organization

Figure 2 illustrates the basic brain areas we will discuss. The view is of the outside surface of the left hemisphere of the brain (brains are composed more or less symmetrical left and right halves, or hemispheres); the "head" is facing to the left.

At the base of the brain is the brain stem, the oldest part of the brain, which extends down into the spinal cord. The brain stem is responsible for basic life functions such as heartbeat and breathing, as well as for alertness, arousal, and basic orientation to the environment. Sitting on the back of the brain stem is the cerebellum, which coordinates smooth motor movements. Damage to parts of the brain stem can interfere with the cerebellum's ability to provide, smooth, fluid movements.

The rest of brain pictured is the cortex, the newest part of the brain, responsible for our higher intellectual functions. The cortex is divided into four "lobes" in each hemisphere. For understanding head injury, the frontal and temporal lobes are most important. The frontal lobe controls planning, organization, and problem-solving, while the temporal lobe contains memory structures responsible for learning new information. In addition, both frontal and temporal lobes are connected to older structures deep within the brain that are the seat of our emotions and drives; damage to the frontal and temporal lobes may alter our ability to inhibit our impulses, or recruit the energy to put plans into action.



(Used with permission of the Maryland Head Injury Foundation)

Figure 2. Major Brain Areas

Three Types of Primary Brain Damage after TBI

Fronto-temporal contusions. The first type of primary damage following a concussive injury results from the collision of the brain with the sharp ridges on the inside of the skull. As the concussed brain moves violently following impact, it is thrown against and bounced off the hard skull that encloses it. The inside front of the skull contains sharp bony ridges which tear and bruise the brain as it moves across these areas. The resulting contusions (or bruises) on the surface of the brain (the cortex) are most likely to occur at the tips and base of the frontal and temporal lobes, because these are the areas in closest contact with the sharp ridges. These localized contusions result in the three most common specific deficits following closed head injury: a) problems with learning and memory; b) problems with planning, organizing, and problem-solving (executive deficits); and c) problems with emotional and behavioral control. Let us understand why these occur.

Structures deep within the temporal lobes play a significant role in the system that registers, stores, and retrieves newly learned information. Following injury to the temporal lobes, previously learned material frequently remains intact, while the ability to learn new information has become severely impaired. Newly learned information is particularly susceptible to "interference" from other information learned immediately before or after. The client with temporal lobe damage may give every indication of being aware of and understanding what is happening, but may appear to "forget" virtually all the new information a short time later.

The frontal lobes are the newest part of the brain from an evolutionary point of view, and allow humans to accomplish the highest and most abstract activities that distinguish us from even the highest primates. Damage to the frontal lobes may severely impair executive and problem-solving functions, as well as disrupt normal control over emotions and behavior.

Executive functions include the abilities to plan, initiate, organize, carry out, monitor and self-correct goal-directed behavior. Persons with frontal lobe executive dysfunction fail to formulate realistic goals, develop effective strategies for meeting goals, fail to monitor and correct performance errors, have great difficulty planning and organizing, and be unaware of the impact they have on others.

Problem-solving functions include thinking abstractly, developing appropriate strategies to solve problems, and integrating diverse information to make good judgments. Persons with frontal lobe dysfunction are remarkably unable to abstract the meaning or essence out of a situation and generalize it to new situations. To everyone's discouragement (including their own), many remain concretely bound to the particular situation they are in. They are

severely limited in their ability to conceptualize and solve problems, especially in unfamiliar situations, or when circumstances change unexpectedly. The result is that what is learned or accomplished under one set of circumstances does not generalize to another set of circumstances. Or, just as bad, they may apply and reapply to new situations what had been successful in the past, even when the new situations call for quite different sets of responses. Failure to consider all the relevant variables or information in situations often leads to poor judgments on the part of the head injured person.

In addition, persons with frontal lobe damage may have poorly controlled or greatly diminished emotions. They may act in childish, inappropriate ways, while being unaware of the nature of their behavior, and how it affects other people. Because the cortical connections that monitor and modulate drives and basic needs based lower in the brain are disrupted, brain injured persons may be impulsive and disinhibited, doing and saying things they would not have before the injury. They may find it exceedingly difficult to control their emotions; if angered or frustrated, they may fly into an uncontrolled rage, because their injury has damaged those neural connections responsible for holding their emotions in check.

Conversely, similarly damaged connections between the higher, willful parts of the brain, and lower brain centers that mediate drive, can result in a paradoxically opposite lack of spontaneous behavior: a syndrome of apathy or adynamia. Clients with such frontal lobe damage may appear to be lazy, unmotivated, unrealistic, careless, and unreliable. They may sit and watch TV endlessly, and fail to initiate any efforts to carry out plans suggested by their counselors. Rather than being the product of psychological processes, as is the case with individuals whose brains are intact, these clients' behavior is the result of organic damage to the brain. The rehabilitation counselor must be aware that such deficits are organically based, will invade all areas of behavior, and are not amenable to exhortation or psychodynamic psychotherapy because they are not psychologically based.

Coup-contrecoup injury. The second type of primary damage following closed head injury is referred to as the coup/contrecoup injury. When the skull is struck in a particular location, and the blow is of sufficient intensity, the skull will bend in, bruising the brain beneath it (the "coup," or "blow"), and drive the brain against the opposite wall of the skull, so that brain tissue on the other side is bruised as well (the "contrecoup," or "counter-blow"). This type of damage does not occur in all closed head injuries; it is more likely when the stationary head is struck by a moving object. When it does occur, it superimposes a pattern of localized brain damage, and hence more circumscribed cognitive deficits, upon the underlying background of diffuse and fronto-temporal damage. The resulting impairments will depend on what specific areas of the brain are damaged, and will "stand out" as additional deficits. Sensory, motor,

perceptual, constructional, or language functions may be selectively impaired following a coup/contrecoup injury.

Diffuse axonal injury. The third type of primary damage in closed head injury is diffuse axonal injury. This is diffuse (widespread, not localized to one particular area) brain damage resulting from the stretching and tearing of nerve fibers (the axons) throughout the brain. This type of damage is most severe when a head that is moving at high speed (as in a speeding car), stops suddenly (as striking the windshield or dashboard). Upon impact, a "shock wave" of rotational forces is applied to the brain, which results in the twisting and shifting of the jelly-like brain mass. As the brain mass twists and shifts, there is pulling and stretching of the thread-like maze of billions of nerve connections (axons) that is the network for brain functioning. Biochemical functioning is disrupted when the axons are stretched, and the nerve stops functioning. Some axons are stretched so severely that they snap; these nerves are unlikely to ever function again. Of those nerves that are simply stretched, some recover and function again (although perhaps with less precision and efficiency), while others degenerate and ultimately pull apart like the severed nerves.

The more severe the impact, the more widespread and severe the damage. Loss of consciousness is almost always the result. If the diffuse damage is sufficiently widespread, or certain parts of the brain stem (the reticular activating system) are sufficiently damaged, the loss of consciousness may last hours, days, or weeks, and is then known as coma. Experimental and autopsy evidence indicate that diffuse axonal injury is most likely to occur in the brain stem (the lowest, oldest part of the brain that is responsible for basic life processes, as well as arousal and alertness), and in the corpus callosum (which connects the two halves of the brain, allowing for integration of complex mental processes).

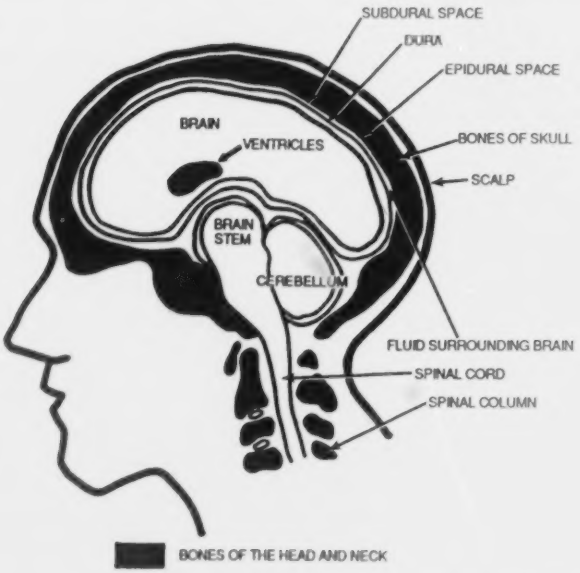
Virtually all patients ultimately awake from a coma. However, widespread diffuse axonal injury almost always leads to permanent, often severe, brain damage. Such clients may suffer from deficits in maintaining an optimal level of arousal; have difficulty coming to, sustaining, and shifting attention; suffer from impaired vigilance; have motor disturbances resulting in impaired gait and/or labored speech; be inconsistent in their performances; and tend to fatigue easily. They may have generalized deficits in processing information that affect both integrated comprehension of their environment. Thoughts may be expressed in labored, roundabout ways, and mental speed and concentration are routinely reduced. The control and expression of emotions may also be significantly altered. In the early stages, regulation of sleep-wake cycles and body temperature may also be affected.

A Note on Length of Coma and Severity of Impairment

The extent and severity of these primary impairments in any given client will depend on both the severity of the injury and the brain sites involved. Generally, the longer the period of unconsciousness the more severe the impairment. This is especially true of the severe deficits resulting from diffuse axonal injury, that is associated with severe brain stem damage and hence extended periods of coma. It is important to emphasize, however, that brief loss of consciousness may also be associated with significant mental impairment. This is because the first two mechanisms of damage, fronto-temporal contusions and coup, contra-coup injuries damage areas of the brain (the surface, or cortex) that are not primarily responsible for consciousness. We have clinically seen numerous patients who barely or never lost consciousness (i.e., had no brain stem damage), who developed aphasia, temporal lobe epilepsy, and other severe cognitive impairments after a blow to the head.

Secondary Mechanisms of Damage

In addition to these primary mechanisms of damage (primary because they occur immediately at the moment of impact), secondary damage is a common consequence of closed head injury. Figure 3 illustrates some parts of the brain involved in this secondary damage. For example, bleeding can result from



(Used with permission of the National Head Injury Foundation)

Figure 3. Parts of the Brain Involved in Secondary Damage

damaged blood vessels, either between the skull and the brain covering (an "epidural" hematoma), between the brain covering and the brain tissue (a "subdural" hematoma) or within the brain itself (an "intracerebral" hematoma). The collection of blood can compress and damage brain tissue because there is no room for the brain to expand within the rigid skull. Pressure within the brain (intracranial pressure) can rise as the brain swells with fluid (edema or hydrocephalus) or becomes engorged with blood. Both of these processes begin complex mechanical and biochemical changes that can result in severe brain damage due to the squeezing of the brain out through small openings (herniation) or tissue death due to loss of oxygen (hypoxia). In addition to the damage caused by these brain events secondary to severe concussion, surgery may be necessary to stop bleeding, remove clots, or relieve pressure or swelling. Additional brain tissue may be destroyed due to these surgical procedures. Finally, there is increasing evidence from animal research that a progressive and destructive cascade of biological events occurs within the first 24 hours after brain trauma, and causes widespread secondary destruction of nerve cells. With all these secondary mechanisms of damage, the resulting impairments may be diffuse or specific, depending on the nature, extent, and location of the brain damage. Secondary damage is more likely after severe injury. When it occurs, it can lead to pronounced functional limitations that may go far beyond the expected primary damage from closed head injury.

RESIDUAL DEFICITS

The residual deficits that result from closed head injury can be grouped for convenience into four primary areas: physical, cognitive, executive, and psychosocial.

Physical Deficits

Physical deficits can range from severe to nonexistent, and are usually related to damage to the brain (i.e., are neurological), rather than permanent damage to the peripheral parts of the body (arms, legs, etc.). While the full range of physical deficits are possible after traumatic brain injury, six common areas of concern can be identified.

Sensory-motor deficits are common after head injury, often because of basilar skull fractures, damage to cranial nerves in the brain stem, or surface damage to sensory or motor cortex. Such deficits might include loss of smell and taste, loss or decreased hearing or tactile sensation, visual disturbances (especially due to loss of control over eye movements), and difficulties with balance (due to vestibular problems).

Motor control and coordination problems (known as ataxia), may occur in more severe head injuries which often result in severe problems because of brain stem damage that disrupts connections with the cerebellum (one coordinator of

our muscle movements). Such patients have awkward gaits, poor control over hand and arm movements, and may have difficulty articulating words clearly (dysarthria), although their ability to use language correctly may be intact. These physical problems are often associated with slowness in thinking and responding as well. They are most common with extensive loss of consciousness, because of the extent of brain stem damage that is implied.

Fatigue is another difficulty and probably the most common physical problem after all head injuries. Even after good recoveries, head injured persons often require more sleep and breaks than needed prior to their injury. More severely injured patients tire even more quickly after mental or physical exertion. This is an important factor to consider in all aspects of rehabilitation, especially competitive employment.

Seizure disorder, or epilepsy will develop in a certain percentage of head injured persons. This is more likely after contusions of the brain or bleeding within the brain, and most often develops within the first year post-trauma (although late-onset epilepsy occurs). Grand-mal seizures, during which patients fall to the ground and shake convulsively, are what most people think of when they think of epilepsy, and these do occur after TBI. However, because of the susceptibility of the temporal lobes to contusion, temporal lobe epilepsy is particularly common after concussive head injury. Rather than the dramatic convulsive movements of grand mal epilepsy, temporal lobe (or partial complex) seizures involve altered states of consciousness, loss of the passage of time, repetitive movements, and often complex bizarre and inappropriate behaviors. This disorder may go overlooked for some period of time. Some neurosurgeons and neurologists will routinely prescribe anticonvulsant medication for a year after injury to prevent seizures; opinion differs on when it makes sense to stop. When a seizure disorder does occur and medications are necessary, it is extremely important that blood levels be monitored regularly to prevent over or under medication. Rehabilitation counselors should also be aware that all antiseizure medications have negative effects on cognition, especially alertness, attention, and memory - an undesirable addition to existing cognitive problems. Since medications vary widely in their effect on cognition, it is important that rehabilitation professionals seeking to maximize functioning make sure that seizure medications are being prescribed and monitored by someone who is taking effects on cognition into account in choice of drug.

Decreased tolerance for drugs and alcohol is the fifth residual physical deficit of head injury. This is extremely important for the head injured client to understand, and is often the cause of serious setbacks in the rehabilitation process. Following diffuse brain damage, the excitatory or depressing effects of drugs and alcohol are more extreme, and come with much smaller doses. In addition, the inevitable killing off of brain cells that comes with alcohol consumption can be ill afforded by a person who has already suffered significant damage to the brain.

The sixth physical problem, headache, is particularly common after minor head injury (the most common type of head injury; see below), especially that type of minor head injury called postconcussion syndrome. Post-traumatic headache can be recurrent and debilitating, and pose a major obstacle to return to functioning after neurologically minor head injuries. Treatment is often in the form of relaxation or medication.

Despite this range of residual physical deficits, however, it has consistently been demonstrated that ultimately physical problems rarely account for rehabilitation failures. Clients, families, employers, and friends seem to adapt fairly well to physical limitations, regardless of their level of severity. It is the neuropsychological deficits that create the real problem in the rehabilitation of the head injured client.

Cognitive Deficits

More troublesome to the successful rehabilitation of clients with head injuries and less likely to be addressed in conventional rehabilitation settings, are the residual cognitive deficits. These typically include impairments in arousal, attention/concentration, learning and memory, speed and capacity of information processing, and abstraction, conceptualization, and problem-solving.

Problems with arousal include a reduced ability to maintain a steady and optimal state of alertness in order to interact with the environment. There are periods of low arousal and difficulty staying awake; of "phasing out" and inattentiveness; slowness in reacting and in processing information, including responding to others; and becoming fatigued easily, often long after the accident, following mental as well as physical exertion. Often, there is a remarkable inconsistency in quality of performance. Problems with arousal and alertness are more common after brain stem damage, long periods of coma, right hemisphere cortical damage, and soon after injury.

Residual deficits in attention and concentration are manifested as easy distractibility: the inability to "filter out" irrelevant or background information; failure to attend to the central or crucial elements of a situation; loss of focus in conversations, manifested as tangential rambling; a breakdown in thinking during extended mental concentration (e.g., doing mental arithmetic, thinking through a plan or solution); difficulty sustaining intense mental activity for an extended period of time (e.g., being able to read for only short periods of time before "drifting off"). All head injured persons show deficits in the area of complex attention: The ability to shift one's focus of attention back and forth among various tasks (as a busy secretary must do), or to monitor various ongoing tasks simultaneously (e.g., driving a car).

Attention and concentration deficits are most likely to manifest themselves when tasks are unstructured and extended. In this regard it is important to note

that most evaluations (even neuropsychological ones) tend to consist of brief, structured tasks that by their nature focus attention and make minimal demands on extended concentration. Clients with attention/ concentration problems, who perform adequately under such circumstances, may nonetheless fall apart under the unstructured, tiring, stressful, boring, or changing circumstances of an applied work setting.

Residual deficits in learning and memory are manifested as a dramatic contrast between the intactness of old learning and overlearned, deeply ingrained skills, and severe impairments in registering, storing, and retrieving new information. In severe cases, the client may be totally unable to remember, and therefore learn, any new material. More commonly, learning and memory decrease sharply as material becomes more extended, complex, must be recalled after longer periods of time, applied in situations of high anxiety, or even in situations that differ slightly from that in which the new material, skill, or behavior was learned. After even milder injuries, incidental memory, i.e., the ability to recall information not specifically attended to, may be severely impaired. For example, misplaced keys, charge cards, packages, and shoes are common; appointments and commitments are instantly forgotten if not written down, despite every good intention and motivation to carry through. Standard intellectual examinations tend to test familiar, previously learned information and skills. Very little new learning or extended memory may be required on standard psychological examination. Head trauma clients often score in the "average" range or above on standard mental ability (IQ) tests, and yet can be severely impaired in their capacities for new learning and memory.

Learning and memory deficits may take many forms, depending on the nature of the brain damage. Deep temporal lobe lesions may cause true amnesias, directly effecting the ability to retrieve new information. Frontal lobe lesions may result in memory problems because of breakdowns in focused attention and organization of information at the input stage. Damage to the left or right side of the brain may result in selective impairment of verbal or visual memory, respectively. Finally, patients will vary in their ability to benefit from environmental cuing to aid in recall. All of these aspects of memory must be assessed in a good neuropsychological evaluation.

Residual deficits in capacities for abstraction, conceptualization, and problem-solving manifest themselves in higher cognitive processes, and may not be immediately apparent in casual conversation. Clients with such impairments may appear to understand the content, meaning, and rationale of what they hear or what is happening to them. However, they cannot profit in any way from the experience. Often persons with TBI cannot abstract out, or conceptualize, the essence or principle from the concrete details of the situation in which it is presented. Therefore, they may fail to apply it appropriately when a new situation arises. Or, they simply miss the point of what is being said, or fail to infer the meaning assumed. They may fail to grasp instinctively the implication

of an event or conversation.

Additionally, individuals with head injury are often inflexible in their thinking, with a resulting deficit in developing adaptive problem-solving strategies in new situations. Having learned to approach a situation or task in one way, the person may fail to adjust when the situation changes or the task is altered, and perseverate on a maladaptive strategy. Furthermore, the internal capacity to generate new and creative solutions may also be impaired.

Deficits in Executive Functions

People with traumatic head injury are likely to show their most debilitating residual deficits in the failure to successfully carry out planned, organized, self--monitored, goal-directed activities. These impairments in executive functioning are not necessarily related to the severity of injury, as measured by length of coma. Impairments of this type can occur in milder injuries where there is relatively brief loss of consciousness, but where frontal lobe structure have been damaged. Neurological examinations may be normal, and patients may obtain good test scores on extended neuropsychological examinations.

Clients who are TBI may respond energetically when engaged by the examiner, and may accomplish each requisite task with only minor problems. Yet their families report that they appear unmotivated, disorganized, promising without accomplishing, and bring nothing to completion. Things that are embarrassing may be said and done without regard for the feelings and reactions of others. They usually have lost their friends and can't hold jobs, despite apparently being capable of doing every aspect of the work. Moreover, they may tell you just what it is they wish to do, state with assurances that they "will be able to handle it." Such persons are described as "talking a good game," giving the impression of competence and good judgement, even though they are totally unable to follow through with, or execute, their plans. It is these executive disorders that frustrate vocational rehabilitation counselors. This problem, more than any other, accounts for the dropout rate of up to 90 percent reported for vocational rehabilitation programs dealing with head injured people.

The above description is typical of persons with head injury with impairments of executive functioning. Many are also significantly impaired in the ability to evaluate their own strengths and limitations realistically. Therefore, the client can be wildly unrealistic in goal setting. The counselor, unfamiliar with disordered executive functioning, may take at face value the appropriateness of the client's plans. This is especially true if their physical and cognitive problems are mild and/or have been treated. The counselor unwittingly set the client up to fail because of the unrecognized executive dysfunction. Even when realistic goals have been set, the client with executive deficits may be unable to formulate, initiate, or carry out a reasonable plan of action. What would be called "unmotivated" in an intact person, is in fact an

organically based inability to plan, put into action, and carry through with an appropriate course of action. When neither client nor counselor appreciate this deficit, frustration looms.

The abilities to modulate, monitor, evaluate, regulate, and self-correct ongoing behavior are frequently impaired. Activity may come in bursts, with sudden changes in intensity or speed. Errors and mistakes may not be recognized and the feedback of others, especially the nonverbal expressions and body language normally relied upon to regulate and change social behavior, may not be appreciated. Thus, the person persists in their inappropriate behavior, with resultant alienation of peers and co-workers.

Failure to self-correct is often fatal in work situations where despite the requisite work skills, the level of performance falls below acceptable standards. Attempts to confront error-prone work and inappropriate behavior is often met with indignant protests and denials, another manifestation of the person's impaired ability to be aware of his/her own behavior. By their nature, executive deficits affect virtually every activity area, whether interpersonal or productive. By the same token, executive deficits tend to be resistant to change and invisible to the person who suffers from executive dysfunctions. It is a truism that meaningful rehabilitation, vocational or otherwise, can only begin when the individual can appreciate and accept the nature and implications of their deficits.

The final, perhaps most persistent, manifestation of executive deficits, is that often the most basic, essential ideas simply do not occur to the persons. Most people take for granted that they will automatically remember and do what is necessary in any given situation. That automatic process, however, has broken down for many individuals with head injuries. A typical example of this problem was given by a person who had spent weeks preparing an autobiographical sketch for presentation before a group. However, he appeared at the podium without his notes. This was not a memory problem per se; he was not trying to remember something and failing. It simply did not occur to him to think to bring his notes with him. The same breakdown of automatic processing can be responsible for the "rudeness" of not saying thank you, the failure to call in sick from work, or forgetting to set the alarm the night before an important appointment. There is a tendency to interpret these behaviors within psychological frames of reference. Thus, the head injured person is mistakenly seen as unmotivated and unconcerned, and treated accordingly. Only when these behaviors are understood as primary deficits, resulting from organic brain damage, can a rational and effective compensatory rehabilitation plan be implemented.

Psychosocial Deficits

The impact of executive deficits extends into the area of psychosocial functioning. The tendency toward social inappropriateness has already been

noted. The person may be impulsive and disinhibited, saying and doing things to the embarrassment of others that they would not have done before the accident. Such individuals are not aware either of their inappropriateness, or of the reactions they evoke in others. Some persons may be sexually disinhibited, or have quick temper outbursts that go as quickly as they come. Such persons are likely to be irritable, impatient, and have difficulty controlling strong emotions once they get started; they lack a "braking mechanism." Their outbursts are usually not personal in intent and unlike the unimpaired persons, they harbor no residual bad feelings toward the person they have just attacked. Counselors and therapists, as well as friends and family members, need to remind themselves of this repeatedly. The temptation to react with one's own anger and rejection can be quite strong.

In addition to sexual disinhibition (the tendency to make impulsive sexual comments or gestures without the usual social constraint), persons with head injury can have other sexual problems as well. Sexual drive can be altered, so that the person experiences either abnormally high or abnormally low sexual arousal. In either direction, this change can have devastating effects on existing sexual relationships, especially in marriage. In dating situations, these changes can lead either to inappropriate aggressiveness, seductiveness, or indifference. These behaviors can either alienate prospective partners, or create potentially harmful situations.

Satisfying sexual relationships seem especially difficult to form following head injury. Judgments about sexual overtures are often poor, the subtlety is lost, and others are alienated. Men in particular often become extremely insecure about their sexuality, with the result that they lack the confidence and assertiveness to seek out sexual partners (of course this is not unrelated to a more general loss of self-esteem). Women in particular are at increased risk for being taken sexual advantage of, or used in sexual relationships. Poor judgement about sexual situations can lead to potential danger, and unintended sexual cues may lead to unwanted advances. Finally, when a person's overall behavior is "off," and things like grooming is careless, they become less attractive to others. Consequently, others also find them less sexually appealing. Unfortunately, this is often the case after head injury.

Other psychosocial problems may result from adynamia, or lack of initiative. Such persons possess the desire, but lack the capacity, to initiate and maintain rewarding social, community and vocational activities. They become isolated, lonely and depressed, and rely on the structure and initiation of others to become engaged in activities.

The combination of the psychosocial impairments described above reflects a changed personality. Family and friends often describe the head injured person as "not the same person he was before." Unfortunately, head injuries frequently may undo the original basis for the interpersonal attraction, and the

head injured person may find him or herself unliked and unloved. Intimate relationships tend to suffer most severely. Most disheartening is the fact that the person is usually unaware of how they have changed, and why people are pulling away. Until the person becomes aware of these changes, and accepts their changed self with new limitations, requiring new goals, successful rehabilitation of any kind will flounder. Experience with retraining programs and careful occupational placement of head injured persons makes it clear that when failure occurs, it is often not because of lack of skills. Instead, the problem is the person's behavior which alienates his bosses and peers. The vocational candidate who has not gone through this process of awareness, acceptance, and internalized the message of being a changed person, is simply unprepared to attempt vocational placement.

The psychosocial problems described above are all primary in the sense that they result directly from damage to the brain. An additional set of psychosocial problems are secondary in the sense that they occur as reactions to changes in the self and are not direct results of brain damage itself. Inability to adjust to new limitations and realities; anger and resentment at what fate had in store; unresponsive or unavailable family or friends; anxiety, avoidance and dependence because of fear of failure or embarrassment; and the frustration, depression, isolation and loneliness that follows from repeated failures and rejections, can all cause major psychosocial problems. Many such persons are friendless, dependent on their families, uninvolved in productive community activities and lack a sense of social identity, as a combined result of the brain damage itself, and their own reaction to their disability.

COURSE OF IMPROVEMENT

Familiarity with the progression of events that leads from the moment of injury to return home is essential in planning treatment for a client with a head injury. Often the question is one of timing: When a client or family is ready to take the next step can be just as important as what is the next step. The counselor also needs to be familiar with a number of specialty terms that neurosurgical and rehabilitation teams frequently use in their discussions and reports. This section will deal with these topics.

In recent years, the advances that have most impacted on head injury rehabilitation have taken place in the Emergency Medical Services (treatment at the scene of the accident and during transport to the hospital), the operating room, and the Intensive Care Unit (ICU). Patients who would have died as recently as five to ten years ago - either at the scene of the accident, or of severe injuries after reaching the hospital - are now surviving. This increase in survival rate, however, brings special problems for rehabilitation. From the neurosurgeon's point of view, "good outcome" after a severe head injury is survival; if in addition the person walks and talks, this may be considered a

remarkable success. From a rehabilitation point of view, however, this survivor is in danger of being an utter failure.

Most head injuries begin "on the street" - fifty percent in a motor vehicle accident, but also in falls and muggings. Relatively few injuries occur in the workplace or at home. In most cases, the person is rendered unconscious immediately by the blow to the head. In some cases, the person is initially merely stunned, and only lapses into unconsciousness after some minutes, or even hours (due to bleeding and swelling within the brain). Occasionally persons sustain significant head injuries, i.e., actual damage to the brain that results in long-term impairments, without actually losing consciousness. While traumatic brain injury usually occurs when the head is struck or strikes an object, it is possible for severe whiplash to cause brain damage due to the violent motion of the brain within the skull. In any case, the person is usually brought to an emergency room for examination and diagnostic tests.

Length and depth of coma are commonly measured by use of the Glasgow Coma Scale (see Appendix A). A patient's eye opening, motor response, and verbal response are noted in response to stimulation, with graded scores being assigned depending on the level of response. The scale ranges from 3 (no eye opening, no movement, no sounds) to 15 (spontaneous eye opening, obeys commands, verbally oriented). Scores of 8 or below are considered true coma, with lower scores indicating deeper coma. True coma, according to the Glasgow criteria, consists of no eye opening, even to deep pain, failure to respond to simple commands, and no comprehensible words uttered. It is important to realize that medical personnel often use a much looser definition of coma, in which patients who have their eyes open at least some of the time, stare and look around, but do not communicate or follow commands, are considered to be still "in coma." This distinction is important in evaluating reports of severity of injury. True coma seldom lasts more than a few weeks. When it becomes months, there is a very high likelihood that very severe damage has occurred. Many clients, however, come with reports of coma lasting weeks or months, when in fact their true coma was only a few days; the confused, disoriented, uncommunicative period has been mistakenly referred to as "coma." Such clients are likely to have much greater rehabilitation potential than persons whose true coma lasted weeks or months.

During this period, numerous diagnostic tests may be run to determine the extent of damage. Most common is the CAT (Computed Axial Tomography) or simply CT (Computed Tomography) scan. This is a sophisticated, computerized series of photographs that gives images of the brain at a number of different levels. The CT scan is extremely useful soon after injury in detecting gross structural changes that may require immediate intervention, either drug or surgical. Bleeding, swelling, bruising, and shifting of the brain can be detected, and life-saving actions taken.

However, it is also important to realize that the value of CT scans decreases later in the recovery process. Once a person has medically recovered and is home, especially years later, there is very poor correspondence between CT scans and functional behavior. Persons whose CT scan shows severe structural damage may in fact be relatively independent and even working, while persons with milder injuries who are disabled by severe executive dysfunction, may have normal CT scans. The reason for this is that the nerve shearing injuries most common in diffuse brain damage are often microscopic in nature, and visible only after autopsy. Also, brain contusions and bleeds may "clear up" with time, leaving brain structure that looks normal, but brain functioning may be impaired. Thus while a CT scan may have saved your client's life in the emergency room, it probably will not be very helpful in making functional rehabilitation decisions years later. CT scans obtained long after injury are most helpful in cases of decreasing mental function, where hydrocephalus or other deteriorating neurological condition is suspected.

A second diagnostic method worth mentioning is MRI (Magnetic Resonance Imaging). MRI (formerly known as NMR, or Nuclear Magnetic Resonance, imaging) is a new, still developing technique, which has three advantages over the CT scan. First, it gives much better resolution of brain structures. Second, it is capable of being sensitive to certain biochemical changes in the brain, as well as structural changes. Third, because it creates its images by reading the electrical output of atomic particles as they are affected by magnetic fields, it does not require the exposure to radiation that CT and X-ray techniques do.

Following emergence from coma, head injured patients typically go through a period of confusion and disorientation. During this period, they tend to be unsure of where they are, what the date and time are, and even of basic facts about themselves and their history. Some are even unable to recall or perform the usual self care activities such as toileting, dressing or feeding. Moreover, they quickly forget information they are told and are unable to remember anything about events that happened even a few minutes earlier. This is the period of post-traumatic (or anterograde) amnesia, during which time the patient has no memory for ongoing events. It may last for only a few minutes after a mild concussion, or up to months after a severe injury with weeks of coma. In the early stages of severe post-traumatic amnesia, many patients are agitated and combative, and often need to be restrained for their own protection, although they usually have no recall later of these events. This agitation is a product of biochemical changes and gross disorientation, not a psychological reaction to the injury.

While post-traumatic amnesia is a temporary condition, a second amnesia that virtually all trauma patients have, retrograde amnesia, is usually permanent. Retrograde amnesia is loss of memory for events prior to the accident. Patients with head trauma almost never actually recall the accident itself. In addition, there is usually some period of time leading up to the

accident - minutes, hours, or days - for which the patient has no recollection. Occasionally a retrograde amnesia can extend to months or even years, but this is relatively uncommon. While the extent of retrograde amnesia may shrink with time, most suffer a permanent loss of memory for some period of time prior to the accident.

Once the patients emerge from coma and go through the period of post-traumatic amnesia, they begin to reorient themselves to their world and bit-by-bit begin to remember ongoing events. There follows a progression of stages leading from confused, inappropriate, sometimes aggressive behavior to organized, appropriate, purposeful behavior. The most commonly used labels for these stages are the Levels of Cognitive Functioning developed at the Rancho Los Amigos Hospital in California (see Appendix B). This scale, usually referred to simply as the "Rancho Scale," has the following eight levels:

1. No Response: The patient is in deep coma and completely unresponsive.

2. Generalized Response: The patient reacts inconsistently and nonpurposefully to stimuli in a nonspecific manner.

3. Localized Response: The patient reacts specifically but inconsistently to stimuli, orienting, withdrawing, or even following simple commands.

4. Confused-Agitated: The patient is in a heightened state of activity with severely decreased ability to process information.

5. Confused, Inappropriate, Non-agitated: The patient appears alert and is able to respond to simple commands fairly consistently; however, with increased complexity of commands or lack of any external structure, responses are non-purposeful, random, or at best fragmented toward any desired goal.

6. Confused-Appropriate: The patient shows goal-directed behavior, but is dependent on external input for direction.

7. Automatic-Appropriate: The patient appears appropriate and oriented within hospital and home settings, goes through daily routine automatically, but frequently robot-like, with minimal to absent confusion, and has shallow recall of what he/she has been doing.

8. Purposeful and Appropriate: The patient is alert and oriented, is able to recall and integrate past and recent events, and is aware of and responsive to his environment.

Medical personnel and families will often refer to the person as being "a level six" or a "four-five" (showing a mixture of both level four and level five

characteristics). Rehabilitation units will often phrase admission criteria for patients in terms of a range of these levels. A detailed description of the levels is given in Appendix B. Like any other descriptive scale, these levels are helpful as a common orienting language. They are concepts of our own creation, however, and should not be taken too literally. Any given patient may exhibit characteristics of more than one level at a time, may have some but not all characteristics on a level, or move back and forth between levels.

Patients differ greatly in the speed with which they pass through these stages. Usually, the longer the coma, the longer the period of post-traumatic amnesia, and the more slowly the patient progresses through the stages. The earliest stages occur within the acute care hospital setting, where the patient moves from the emergency room, usually to an intensive care unit, and then to a neurosurgical or trauma unit. Patients stay in the acute care hospital only until they are out of danger and medically stabilized; they are then discharged. This process can take only a few days in the case of a mild injury; more severe head injuries require weeks, and occasionally months, of acute care hospitalization, especially if surgery is required, or complications develop.

Where the patient goes after discharged from the acute care hospital depends upon the patient's capacity to pay for care or receive benefits, the severity of the injury, the degree of physical impairment, the availability of rehabilitation facilities in the area, and the sophistication of the medical staff. Patients with milder injuries, especially if they have no physical involvements that interfere with walking or functional activities, are usually discharged directly home. Unfortunately, these patients often have sustained mild to moderate cognitive impairments which are rarely evaluated in the acute care setting. Unaware of what to expect, the patient frequently attempts to return directly to work and all previous activities, often with disastrous results. For these clients, the rehabilitation process starts belatedly with education and awareness. (See section below on "Mild Head Injury").

Patients with more severe head injuries may be discharged from the acute care unit to a rehabilitation unit or hospital. Conventional rehabilitation settings concentrate on physical impairments that interfere with functional activities: walking, talking, eating, dressing, etc. (commonly referred to as "Activities of Daily Living," or ADL's). Increasingly, rehabilitation hospitals are paying attention to the cognitive and behavioral needs of their head injured patients; however, the primary focus in the acute rehabilitation stage is on physical improvement. Most head trauma patients stay 3-12 months in the rehabilitation hospital, depending on the severity of their injury.

In recent years there has been an upsurge in specialized head trauma rehabilitation. This either takes the form of a head trauma unit within the conventional rehabilitation hospital, or a rehabilitation hospital that serves brain damaged patients exclusively. These specialized units differ from conventional

rehabilitation units in three ways. First, their staff is specially trained and experienced in dealing with the problems of patients with head trauma. Second, the daily program for all patients is built around the needs of patients with head trauma, so care is more consistent. Third, there is an increased emphasis on addressing cognitive needs and behavioral disorders as the patient progresses through stages of improvement.

Following this acute rehabilitation stage, when the person has been a full-time inpatient, the postacute rehabilitation stage begins. This usually consists of a program of outpatient services including physical, occupational, and speech therapy, as needed. Whether outpatients receive any help specifically for their cognitive and behavioral problems will depend on the sophistication of the hospital, the availability of such services and available financial resources. This stage of outpatient therapy will usually last for 6-12 months, occasionally longer. Therapists are often reluctant to continue working with patients in whom they see no "gains," and most insurance and government payment plans stop paying when continuing gains are no longer reported. When a person "plateaus," usually within two years after the injury, formal rehabilitation most often comes to an end. (See Myth #3, "The Concept of Plateau," below in "Debunking Ten Myths of 'Recovery'").

By this time, the typical patient will be ready to attempt to return to work or school, and often may seek help from the state office of vocational rehabilitation. Success in returning to work is a complex issue, which depends on a number of factors to be discussed below. Unfortunately, even with complete involvement of the available rehabilitation system, significant numbers of persons with TBI fail to resume productive lives, at least in the traditional sense that emphasizes school or work. Consequently, persons who are physically fit spend years, often their entire lives, dependent on others for their livelihood. Because of their mental and psychosocial impairments, these survivors are unable to work, usually lose their friends and may alienate their families. A syndrome of unemployment, isolation, and depression sets in, that is catastrophic for them, a severe drain on their families, and extremely difficult for professionals to deal with successfully.

RANGE OF SEVERITY

For the sake of convenience, TBI clients can be divided into four groups. While their injuries form a continuum in range of severity of injury, each group has characteristic courses of improvement and outcomes.

Mild Head Injury

Special problems and issues. Mild head injuries are characterized by

very brief (a few minutes) or no loss of consciousness; the research literature has adopted 20 minutes or less as the arbitrary criterion. While sports injuries are a common cause of mild head injuries, car accidents, falls, and blows to the head also contribute. Often the person regains consciousness before arriving at the hospital. Depending on the evaluation of the physician, and certain environmental variables (e.g., whether the patient is alone, or drunk), such a patient may be sent home, or admitted to the hospital for a few days observation. CT scans are usually normal. Headaches, nausea, and dizziness are common complaints, and usually - but not always - improve over the first few weeks. Patients who have such a constellation of symptoms - which also includes cervical neck pain - are referred to as having a "postconcussion syndrome."

Because neurological examinations are often normal after the first day or two, it used to be assumed that patients with mild head injuries suffered no permanent or structural damage to the brain. A significant number of these persons continue to complain of difficulty concentrating and performing their jobs or schoolwork. Commonly, these complaints are taken as evidence of malingering, and may be labelled an "accident neurosis." Recently it has become clear, however, that shearing forces can cause microscopic nerve damage that is not apparent on gross neurological examination. Both human autopsy and animal research has demonstrated microscopic brain stem changes that may be the organic basis for continuing symptoms of poor attention and concentration, impaired memory, and lethargy, which are common after mild head injury. More attention is being paid to the subtle but debilitating cognitive impairments that can result from mild head injury. One study in Virginia found that 33 percent of such adult patients remained unemployed for at least three months after their injury (Rimel et al., 1981). Other studies have found that significant numbers of such persons perform poorly on demanding attention and concentration tasks years later.

Moreover, it is possible to sustain significant brain damage with demonstrable neurological abnormalities when there has been only very brief loss of consciousness. Such persons may suffer the frontal and temporal contusions that are not marked by coma, but lead to severe impairments in learning, memory, the executive functions, and emotional control. There is some evidence that MRI scans are more sensitive than CT scans to focal brain lesions after minor head injury. Patients with such focal lesions after brief loss of consciousness may be different from patients with "post-concussion syndrome," where no focal damage can be found even with MRI, and who suffer from headache, neck pain, dizziness, nausea, blurred vision, lethargy, attention and memory loss, and depression.

Following mild head injury, most of these persons attempt to return to school or work quite soon after their injury, usually within a few weeks. They

usually encounter significant difficulties for some period of time. They often find they are unable to maintain their pre-injury performance level. Unfortunately, most people suffering the effects of mild head injury have no way of understanding the problems they are facing. Typically, as a result of even mild impairments in mental functioning, people feel incompetent, guilty, frustrated, and often fear that they are going crazy. Those who enter traditional psychotherapy do not find relief from venting feelings or self-understanding, because the problems persist. Their family and friends think they "should be back working" because they do not appear to be abnormal. Far from malingering, however, such persons are usually extremely frustrated with the problems they are encountering and eagerly seek help to get back on track.

It is also apparent that personality and environmental factors can play a large role in how functionally disabled a person becomes after relatively minor neurological damage and cognitive deficits. In other words, it matters not just what the injury was, but to who it occurs. Persons with personality disorders, or a poorly integrated sense of self, may adjust very poorly to the "cognitive slippage" that remains after a mild head injury. Another person who is more adjusted emotionally may suffer the same degree of damage and deficit, but respond with much less distress and dysfunction. Clinical experience indicates that many persons, who become dysfunctional after minor head injury to an extent that seems to go beyond the extent of the neuropsychological deficits, were hard-driving, perfectionistic, anxious, and perhaps over-achieving. Such persons seem particularly thrown by even modest reductions in cognitive capacity, much as an overloaded boat begins to sink if it loses speed.

It also appears that the impact of minor head injury interacts with vocational level to determine outcome. Subtle problems with attention, memory and problem-solving may be much more vocationally disabling to a lawyer than a construction worker. The more cognitively demanding a job, the more devastating the impact of "subtle" deficits. (This emphasizes the point that what might be called a "mild" deficit in a report may have a major impact on functioning; "minor" does not mean insignificant.)

Environmental problems. Environmentally determined financial incentives may also play a role in determining the level of functioning of persons with minor head injury. While is appears that relatively few patients consciously malinger and feign symptoms or disability, the prospect of a large financial settlement - if the person is unable to work - can act as a strong, if unconscious, disincentive to "get better." The result can be that persons with legitimate deficits following minor head injuries may become more intensely focused on their symptoms and less able to function - especially when they are aware of their cognitive deficits and are worried that they may not be able to function adequately.

The typical person with mild head injury, demonstrates to the careful observer, that a brief loss of consciousness and a normal CT scan do not mean that there has not been damage to the brain sufficient to seriously interfere with functioning. The vocational rehabilitation counselor is usually asked to become involved once the person has failed to return to work successfully - and perhaps has tried two or three other jobs before it becomes apparent that significant problems were interfering with the head injured person's ability to perform adequately.

The process of rehabilitation after minor head injury can be preventive or reactive. Preventive rehabilitation involves early (i.e., soon after hospital discharge, or even during hospitalization) identification of patients at risk for long-term cognitive and functional problems, education of them and their family, and careful monitoring of a gradual return to functioning and work. That seldom occurs. More common is reactive rehabilitation, which begins only after a patient with a mild head injury has encountered months or years of failure and frustration. Such patients become anxious, avoid situations they may fail in, become socially isolated and depressed, and develop a negative sense of self. This "psychological overlay" accumulates quickly over time, and by the time many mild head injured patients come to professional attention years later, may become even more debilitated than the underlying neurological deficit that fueled the decline.

Rehabilitation goals. With such persons, the first goal is a precise neuropsychological evaluation which begins the process of sorting out what dysfunction is due directly to the primary deficits caused by damage to the brain, and what dysfunction is a secondary result of the psychological reaction to the inability to function as well as they had come to expect.

The second goal is to provide support, encouragement, and reasonable behavioral challenge to begin to move the mild head injured person toward higher levels of functioning. This process focusses on areas of dysfunction that are secondary, and created by maladaptation to the core deficits.

The third goal is remedial in nature: the patient must learn to identify what the primary, core problems are that result from the injury and cannot be undone. Methods of compensating, developing new strategies, and environmental alterations will all be used in this cognitive remedial phase.

The final goal is the same as for other levels of severity: an awareness of one's new limitations and an acceptance of the necessity for revised life style and goals. This process, common to all head injured persons, is often complicated after minor head injury because of the lack of apparent deficit; even the patient's family may grow weary of the inability to function and withdraw support.

Moderate Head Injury

Moderate head injury is characterized by a more extended period of unconsciousness; the person is said to be in a coma, and this coma can last from an hour to many hours. These patients are hospitalized in the acute stages. They may or may not go to a rehabilitation hospital, depending on the extent of their physical impairments. In virtually all of these patients, some degree of mental impairment is obvious; it may range from mild to severe. Their rate of improvement is slower than in mild cases and the period of post-traumatic amnesia can last days or weeks. If they are not admitted to a rehabilitation hospital, such patients may receive outpatient rehabilitation services. It is usually within 6 to 12 months after their injury that they first attempt to go back to work, or think about new work if their impairments are more obvious. It is at this point that the vocational rehabilitation counselor usually becomes involved. A number of studies have found that up to two-thirds of such patients are unable to return to work a year or more after their accident.

Severe Head Injury

Severe head injury is marked by periods of coma that last for days or weeks, and such patients usually have more extensive physical impairments as a result of brain stem damage. They have slower, more extended courses of recovery, and may spend a year or more in a rehabilitation hospital. It is clear to all that these patients have sustained significant permanent damage. They have a much lower rate of employment than the moderate head injured and it may be a year or two before they are ready to consider any level of employment. If such patients do return to work, it is usually after a number of years, at a much reduced capacity, and with a sympathetic and flexible employer.

Many persons who have become severely head injured require the supports of sheltered workshops, day activity centers, or other supported activity programming. Most will remain dependent on their families or social agencies for their care.

Catastrophic Head Injury

This category is reserved for the most severely damaged head injured patients who may never regain meaningful communication with their environment. They usually remain in institutions until they die. They usually had true comas of many weeks or even months. Even though they appear "awake" in the sense of looking around them, perhaps allowing themselves to be fed, and have sleep/wake cycles, they may never speak, follow commands, or show any consistent ability to understand what is said to them. Such patients are technically classified as being in a "persistent vegetative state" or "coma vigil," although family members often refer to them as still "in coma." When

this state persists long after true coma has ended, such severe and widespread brain damage has occurred that it is highly unlikely that there will be any significant improvement. For such patients, employment is never an issue.

Conclusion

The categories of residual impairments described above are arbitrary, not clean cut, and almost impossible to predict as outcomes soon after an injury. Patients who appear to have stopped improving may suddenly spurt forwards; others who appear to be making rapid progress may suddenly level off. In making long-term rehabilitation plans for TBI clients, especially when return to work is concerned, it is extremely important not to make final judgments prematurely. There is simply too much unpredictability and individual variability to know what will be happening in six months. Also, even after the brain has stopped healing, significant environmental changes can lead to sudden increases or decreases in functional ability. Repeated evaluations are required both during and AFTER the formal rehabilitation process, to assess changes in the client's vocational potential accurately. Clients who are not ready for vocational consideration at one point in time may appear quite different in six months or one year.

DEBUNKING TEN MYTHS OF "RECOVERY"

Myth #1: The Concept of "Recovery"

Throughout this chapter we avoid such phrases as "recovery after head injury." There is a reason for this. Most people's experience, and therefore expectations, regarding illness and injury is one of temporary reduction in functioning, followed by a gradual return to normalcy. People get sick, go to the hospital, and get better. Bones are broken, casts applied for a period, muscle strength regained over several months, and scars fade.

When commonplace notion of recovery is applied to head injury, however, considerable harm can be done. Almost never does a patient "recover;" the residual deficits are usually significant and permanent. The continual expectation of recovery can lead clients and families into denial, frustration, disappointment, and even worse, extremely unrealistic expectations and planning. Moreover, the successful rehabilitation of the head injured person cannot take place until they and their family are aware of the permanent limitations, accept them, and formulate new goals based on changed expectations. To speak of, and implicitly believe in and hold out the hope for recovery, can severely impede this process. Of course, this process of awareness and acceptance, on the part of the family, is a process that takes time. Certainly families, especially in the early stages, must hold out hope. However, we prefer to speak in terms of hope for as much improvement as possible, to build in realistic expectations from the beginning.

Myth #2: Recovery Occurs in a Year

It was a traditional rule of thumb for physicians to tell patients and families that "whatever recovery will occur will happen in the first 12 months." This was probably based on the observation that the neurological examination at one year was quite predictive of neurological status years later. Neuropsychological research unwittingly advanced this myth by looking at groups of head injured patients and discovering that the group mean on certain tests stabilized at about one year. Unfortunately, families understood all this to mean that functional recovery stopped after a year. Nothing could be further from the truth. First, more careful research seems to show that the duration of improvement varies as a function of severity of injury; less severe injuries improve more quickly, more severe injuries more slowly. Second, group averages hide individual variations. While the average group score on a test may not change significantly after a year, individuals within that group may continue to improve. Third, neither neurological nor cognitive status is the same as functional ability. Often, it is the environmental changes that occur years later - the death of a parent, the establishment of a relationship, the establishment of a new local program - that is the trigger for a spurt in functional gain.

The danger with the "recovery occurs within one year" myth is that it lulls families and professionals into thinking that the client's level of performance at one year is what everyone is stuck with. While the major brain healing may well have occurred within this time frame, true rehabilitation may just be beginning. On the other hand, many patients and families who have been told the patient "would recover in a year" interpreted this to mean that no matter how severe the injury, by a year the patient would recover fully. This expectation has set the stage for much bitterness and unnecessary disappointments for patients and their families.

Myth #3: The Concept of Plateau

Closely related to myth number two, this concept says that "recovery" starts after emergence from coma, continues at a gradual upward pace, then slows down, and levels off, so that no more improvement occurs. The visual analogy is a geographic one - a plateau. This myth leads families to despair when rate of change decreases and causes therapists to terminate services when clients stop progressing. There is a tendency to "write off" clients when a first "plateau" has been observed. It is true that the most dramatic improvement does take place in the earliest stage and is followed by more gradual changes. However, the concept of plateau is dangerous for two reasons.

First, improvement following head injury is characterized by fits, starts, and bursts, often interspersed with periods of apparently little change, or even falling back. Head injured patients are notoriously inconsistent in their progress, at all stages. They may take one step forward, two back, do nothing for awhile, then

unexpectedly make a series of gains. When one is preoccupied with watching for plateaus, it becomes easy to disengage from the client whose progress is sputtering.

Second, long "plateaus" can be interrupted years later by energizing environmental events. The appearance of a new, committed counselor, or the influx of social contacts that come from being "forced" to a support group, can uncover functional potential in head-injured persons that has lain dormant for years.

Myth #4: The Lourdes Phenomenon

This is often a side effect of subscribing to Myth #1 (the Myth of "Recovery"). The reference is to the town in France (Lourdes) where miraculous cures of illness are reputed to take place. There are many families who firmly believe that some "miracle" will occur after brain injury and return their loved one to normalcy (recovery). Belief in this myth often takes the form of "doctor hopping" or "program hunting." Families will put the head injured person through every available program or with every available therapist. Despite any tangible signs of improvement, many will continue to believe that if only they could find the right person or right approach, everything would be better. Of course it is true that often head injured patients make significant gains only when hooked up to a competent therapist or top-notch program, but that is not what is meant by the myth. Families who believe in this myth cling to the most unrealistic expectations when it is evident to everyone but them that their loved one has limitations which are not going away. The solution lies not in finding the right "cure," but in helping patients and families become aware of and accepting the limitations and developing new goals and expectations.

Myth #5: Normal IQ

Often, upon request, naive psychologists will examine a head injured person on a traditional battery of intelligence tests, find that the IQ (the numerical average of the many subtest scores) is in the average range, and then pronounce the client "cognitively recovered," or "capable of functioning intellectually in the average range." This myth is dangerous because it can seriously misrepresent the client's deficits, and create unrealistic expectations in the minds of others that set the client up for serious failure. The conclusion is a myth for three reasons.

First, an IQ score is a composite of many different scores. An overall IQ score can mask severe variability among performance levels; the person in the "average range of IQ" can be performing in the superior range on some tasks, but be severely impaired on others.

Second, regardless of the variability among the subtests, an "average" IQ

score may represent a serious deterioration in intellectual capacity in a client who was premorbidly quite bright, leaving him or her totally incapable of functioning at the level achieved prior to the accident. Persons who experience a drop in IQ from the superior to the average range do not then function in the average range. Their scores have dropped because significant cognitive dysfunction is interfering in the consistent application of their intelligence. These breakdowns thrust them far below "average" in real life abilities and functioning, despite the measured IQ.

There is a third reason why "average IQ" is largely irrelevant in the assessment of persons with head injury. Simply put, traditional intelligence tests bear little relationship to the mental processes required for successful everyday functioning. They are composed of brief, highly structured, artificial tasks, that emphasize old learning and overlearned skills. Head injured persons who can perform quite well on such tests may have such breakdowns in learning, memory, and especially executive functions (planning, organizing, self-monitoring) in the unstructured real world that they are totally unable to function. "Average range IQ" and even higher IQ scores should never be the basis for concluding that a client is cognitively intact, and therefore ready to handle mental stresses of the real world.

Myth #6: The Normal Neurological Evaluation

Just as normal range IQ's should not be mistaken for cognitive normalcy, a normal neurological evaluation - especially late after injury - should not be mistaken as meaning that there is no brain dysfunction. As noted above, acute bleeding and contusion of brain tissue may clear up and disappear from brain scans over a period of months and years - even though nerve networks and biochemical balances may still be severely effected. Also, because head injury is primarily a diffuse brain injury (i.e., involving damage at many scattered locations), it often is not possible to determine a neurological focus of damage as is the case after stroke or tumor (which affect primarily a single area in the brain). Physicians trained in the tradition of "behavioral neurology" are more likely to attend to impairments of higher cortical functions, but many truly dysfunctional head injured persons are misleadingly described as neurologically "normal."

Myth #7: Malingering

This issue has been dealt with above, and will be only briefly summarized here. Simply put, it is the exception, not the rule, to find clients who are consciously using their deficits to their advantage. The vast majority of head injured patients are extremely frustrated and very eager to get on with their lives. Unfortunately, it is true that a learned dependency is often established; many head injured persons become so used to others doing for them, that they come to believe that they are incapable and must be dependent, and therefore

resist efforts to get them to do more things on their own. While this process is insidious, common in clients who have been home and inactive for years, and absolutely destructive to the rehabilitation process, it is not malingering. Learned dependency is by definition learned - and therefore can be unlearned. Malingerers, however, become more resistant, not less, as they are forced to do more. Most head injured malingerers will probably show evidence of similar behaviors prior to their accident, and should be identified by sophisticated neuropsychological evaluation.

Myth #8: The Disordered Life and the Need for Psychotherapy

Many people who enter traditional psychodynamic psychotherapy do so because they are dissatisfied with their lives. Their dissatisfaction may be due to being unsure of themselves, goals that are not clear, inability to accomplish what they want, unsatisfying relationships, anger or fear, or they are depressed. Psychotherapy offers them a chance to explore their feelings and past, uncover and resolve the conflicts that interfere with their lives, vent their frustrations, and get on with their lives.

Unfortunately, although many head injured persons fit the above description - and thus get sent into traditional analytic or psychodynamic therapy - they often get worse, not better, to everyone's dismay. This happens because the disorder in their lives reflects not primarily underlying psychological conflicts, but the damage to their brains that has resulted in cognitive and executive dysfunctions. Their lives are disordered because their brains are disordered. "Talking things out" does not solve the problem and may worsen it. This is because traditional therapy removes structure and encourages the spontaneous expression of whatever thoughts and feelings seem most important. Such a process is guaranteed to lead to further disorganization and confusion in a person whose major problem is structuring and organizing the thinking processes, while trying to keep surges of emotion from washing everything away entirely.

When individual "therapy" is a successful adjunct to a rehabilitation program, it is a structuring, supportive, problem-solving approach. This does not mean that head injured persons cannot have mild or severe psychological problems that either result directly from, or exist (usually existed) separately from the results of their injury. They can, and often do. It does mean, however, that the traditional psychodynamic approach seldom offers the head injured person relief from their disordered life. The psychotherapist who specializes in brain injury must have an appreciation of the impact of brain damage on the patient's capacity to benefit from the process of therapy. Rehabilitation professionals should seek out such specialists if their clients require psychotherapy.

Myth #9: Drugs as Satans and Saviors

The other type of therapy susceptible to mythology is drug therapy - the use of drugs to treat various emotional, behavioral, and even cognitive problems after brain injury. This is a bipolar myth: The equally invalid myth that drugs are always bad (Satans) or the only possible cure (Saviors) for difficult problems after brain injury.

The **Satanic** myth holds that drugs can only do the head injured persons harm and should be avoided at all costs. This myth evolved from a basic truth: Many drugs given to brain injured persons have undesirable cognitive side effects and cause more harm than good. Certain antiseizure medications cause attention and memory problems, and choice of medication often does not reflect this awareness. Minor tranquilizers (such as Valium) which may calm anxious or tense persons without brain damage, may cause memory problems, poor judgement, and emotional control problems in head injured persons. Major tranquilizers, which organize psychotic thinking and calms agitated behavior in schizophrenics, can have the opposite effect after brain damage. The dampening of the neurotransmitter systems (which helps the schizophrenic) after brain injury decreases cortical functioning, worsens cognitive deficits, leads to more confusion and disorganization, and thus poorer thinking and increased agitation.

Nevertheless, intelligent pharmacology instituted by someone who understands how the damaged brain reacts to drugs can, when used in moderation, be very helpful. Certain seizure medications have fewer cognitive side effects. Drugs that selectively block or enhance very specific neurotransmitter systems have the potential to decrease anxiety, lift depression, and perhaps (although this is still controversial) even enhance certain cognitive functions such as focused attention and memory. Drugs are dangerous - but not Satans.

Nor are they **Saviors**. Occasionally professionals will encounter families who have heard claims made about new drugs that promise all manner of neurological, cognitive, and behavioral improvement, and latch onto such drugs as the "miracle" (see Myth #4) which will cure the problem. Often these are families who have suffered a long time with a difficult head injured family member, and who are having great difficulty coming to terms with the severity and permanence of the disability. No drug known will eliminate the problems of head injury. In general, less is better - but intelligent, selective use can be helpful.

Myth #10: The Rehab Wizard

This is a new myth. That it exists at all is a tribute to positive changes in the system of head injury rehabilitation. The Rehab Wizard practices a craft

that goes by many names: cognitive remediation, cognitive rehabilitation, cognitive retraining, and others. The Wizard has a computer (usually an Apple, but now maybe an IBM clone) and an armful of software. They load a diskette, wave a magic mouse, and "presto," cognitive changes begin to occur. "Your client is unable to work because of memory deficits? No problem!" Send him (or her) to the Wizard for a 10-week course of memory retraining; remediate that deficit, and back to work he'll (or she'll) go.

Such cures don't happen, of course. No professional - even one with a hard drive and a 386 coprocessor - has the wizardry to eliminate cognitive deficits due to damage to the brain. The brain is not a muscle that can, once damaged, be exercised back to fitness by sheer repetition. Many head injured persons and families have been tragically let down by the belief that cognitive retraining would be the "answer" to debilitating cognitive and behavioral problems. Families and professionals must share responsibility for this misconception, but the reality is that the competent cognitive remediator, far from being a wizard with special knowledge and tools that others do not have, is a skilled and wily clinician who is willing to use technology, exercises, and guided repetition to guide the client in relearning lost skills, learning to focus and sustain attention, learning to identify when cognitive breakdowns occur and how to compensate for them, and how to use new strategies to solve problems when the usual ones don't work.

When understood in this context, cognitive remediation (in the narrow sense of specific, often repetitive tasks) or neuropsychological rehabilitation (in the broader sense of modifying maladaptive behavior and cognition using cognitive and psychological principles) can be an essential part of the rehabilitation process after head injury. Indeed, it is the increasing awareness that the neuropsychological problems are the most devastating that has led to the admirable attempt to treat cognitive deficits as the focus of, not just an impediment to, rehabilitation. We are becoming both more sophisticated and selective in our cognitive interventions, and hopefully scaling down what we explicitly (or implicitly) promise. The myth of the Rehab Wizard will fade slowly, however, because it would be so good to believe that we could develop a technique to undo the terrible effects of brain damage.

FACTORS IN LONG-TERM IMPROVEMENT

"Improvement" after head injury needs to be considered from at least two points of view. First, improvement refers to recovery of brain-related functions: neurologically, the amount of nerve tissue that returns to functioning; and neuropsychologically, the extent to which there is measurable improvement in cognition and behavior. Second, improvement also refers to functional gains which are only partially related to neurological improvement. In the early stages after an injury, functional improvement is closely related to neurological

change. In later stages, however, the two dissociate and functional improvement, or backsliding, can occur even after neurological change has ceased. The following factors in long-term improvement reflect both aspects of improvement.

Severity of Injury

It is generally true that the more severe the head injury, as measured by length of either coma or post-traumatic amnesia, the slower and less complete is the improvement. This is true because the extensiveness of damage bears a direct relationship to the duration of coma; one is unlikely to have been unconscious for days or weeks without the brain having been severely damaged. Thus, longer coma is associated with more severe cognitive and behavioral impairments, and reduced probability of returning to work.

Length of coma appears to interact with age in predicting who will return to work. For any given length of coma, the percentage of young adults returning to work is greater than that of older adults.

Coma is only one way of measuring severity of injury, however. As has been noted above, head injury with relatively brief loss of consciousness can result in severe deficits if temporal and frontal damage occurs, far distant from brain sites regulating consciousness.

Pretrauma Factors

Although it is extremely difficult to establish through research, it appears that a number of pre-existing factors influence outcome after head injury. Foremost among these are the client's cognitive abilities prior to the accident. Intellectually brighter, more cognitively intact individuals appear to fare better in their cognitive improvement, especially in their ability to develop compensatory coping mechanism to circumvent existing cognitive deficits. Since formal testing is rarely available on clients prior to their accident, we must rely on school performance and level of job responsibility as estimates of pretrauma intelligence.

Personality also plays a major role in how clients respond and bounce back after a head injury. While personality may be altered or exaggerated after a head injury, dominant personality characteristics often remain and influence the course of improvement. Persons who were: "fighters," responded to challenges, were motivated, tenacious in dealing with adversity, believed in themselves, and yet are open to the guidance and experience of others have an advantage. They often can maintain their spirit through the frustrating ordeal of rehabilitation after a head injury, in benefitting from rehabilitation efforts, and in becoming aware of and accepting the implications of their injury. Conversely, persons who were chronically depressed, easily overwhelmed by

stress, or resistant to the efforts of others to help them, may have a more difficult time with the rehabilitation process, with corresponding limitations on the level of functional improvement they ultimately achieve. Persons who tended to be perfectionists or had very high standards for themselves prior to injury, have mixed reactions to rehabilitation. While they tend to be "motivated" and set high goals for themselves, they often have great difficulty acknowledging their limitations, coming to terms with their error-prone performance, and adjusting their work and social goals downward.

The Family System

Head injury happens to the entire family, not just the injured person. Every family is a system of relationships, roles, and delicate interpersonal balances, and is characterized by "homeostasis," a state of balance or equilibrium. Any internal (e.g., fight, divorce, death) or external (e.g., loss of job, difficult neighbors, move to a new city) change disrupts this equilibrium, throws the family out of balance. The family system instinctively seeks to right itself by establishing a new homeostasis, often with an altered set of roles and relationships.

A head injury to a family member dramatically alters the balance of the family system - the homeostasis is destroyed. Time, money and resources are reallocated around the head injured person, family members take on new responsibilities, the importance of the needs of others changes, relationships are altered - not just with the head injured person, but among other family members as well. As time goes on, the family faces the task of readjusting its roles and relationships to acknowledge the changed capacity of the injured member. Families differ enormously in their capacity to negotiate this change, and re-establish a functional homeostasis. The astute rehabilitation counselor, in assessing the client's capacity to return to work, will also assess the family environment in which that client exists.

The environment to which head injured persons return is absolutely crucial to the nature and extent of their improvement. Families can facilitate or hinder the rehabilitation process in extremely important ways. The extent to which families' expectations are realistic, how well they can balance hope and pragmatism, their ability to provide enough structure, guidance, and protection to support the head injured person without fostering dependence are all important factors. Their knack of knowing what challenges are appropriate and within reach, will also influence how the family member with a disability adjust to their new circumstance. Some families are so blindly unrealistic that they attempt to push the client into - and squeeze out of the system - plans, programs, and situations that are simply beyond the person's capacity. Other families become so protective that they foster dependence and squelch effort. It is probably true that how families have handled crises in the past (especially developmental autonomy issues), how flexible they are in restructuring their

roles and expectations, how mature individual members are, and capable of tolerating stress, will determine to what extent the family will facilitate or impede improvement.

Most families go through predictable stages in responding to the fact of a member becoming head injured. In the initial stage, immediately after the accident, all resources are focused on the survival and medical recovery of the patient; no thought can be given at this time to long-term outcome issues. During the acute rehabilitation stage, families begin to worry about the extent of "recovery," but are generally encouraged by the inevitable gains. Late in this stage families begin to confront the possibility that "recovery" may not be complete, although it is too early for the reality of that to sink in.

There is a "honeymoon" period once the patient is discharged home, full of relief and gratitude, and expectations of extensive "recovery" tend to be highest at this time. As the months go on, however, and the joy of having their loved one home again subsides, the irritating and difficult changes in the person become noticeable. Still, the attitude is often one that simply more effort is needed. By the end of a year, frustration and anger may begin to set in as family members realize that they are living with a changed and possibly very difficult person. This period can be most trying for both the person with the head injury and the family. It is often marked either by deeply entrenched behavioral ruts or a flurry of activity to find the right "solution" within the system. Professional counseling and guidance is often needed and very helpful during this period. While the danger of remaining stuck at this stage is very real, some families will move through a stage of "mourning" the loss of the old person and accepting the new one. With this movement, much of the anger and frustration begins to subside. The final stage is one of reorganization, in which the family having accepted as best they can the "new" member and rearranges their life in the most adaptive way. It must be recognized, however, that such adaptation is painful and difficult at best. Families that must incorporate a head injured person live always with a certain degree of sadness and dashed hopes.

It is also important to recognize that this adjustment is not static, but cycles through the developmental process of the family's life. The young mother, whose husband becomes head injured, may make peace with being the sole care giver of an infant. However, new adjustment issues surface when the child starts school or becomes an adolescent. The family's life cycle will present new challenges, crises, and adjustments that relate to the presence of a head injured family member. How well the family negotiates those challenges will have a dramatic effect on the functioning of the head injured person, not just the other way around.

Capacity for Awareness and Acceptance

Separate from the premorbid intellectual and personality factors that

influence outcome, there is a one "person variable" that appears absolutely essential for the successful rehabilitation of the head injured person. More than anything else, it may determine the extent of functional improvement. This variable is the head injured person's capacity for becoming aware of his or her deficits and limitations, accepting the reality of a new self, and being willing to set and accept new goals. Unfortunately, the executive dysfunctions that limit self-awareness militate against this. Hence, a crucial part of rehabilitation counseling involves some external person providing - often over and over again - the feedback, messages, and conclusions that so many persons with head injury are unable to provide for themselves. In this sense, the counselor acts as an external set of frontal lobes. Intact persons who encounter failure usually will be aware of the reasons for that failure, and develop a plan for altering the situation or a strategy to avoid failure in the future. Head injured persons are unable to do that for themselves; and worse yet, are unaware that they cannot. Experience in retraining programs with head injured persons for whom conventional rehabilitation has "failed," indicates that those persons who successfully integrate the message of their "changed self" - who really understand it, believe it, accept it, and can set and accept new goals for themselves - are much more likely to become reintegrated in society at some level, to become productive, and to find and maintain appropriate jobs.

Community/Employer Support

Beyond all the factors within the person and the family that influence longterm improvement, there must be sufficient resources and flexibility within the community and work situation to receive and adequately serve the individual with TBI. Whether there is an effective - and affordable - head trauma program available, is one big factor. Whether the community provides additionally needed resources such as day programs, competent therapists, school programs, etc., will certainly influence these individuals' chances for long-term improvement.

When return to work becomes an issue, the availability of appropriate jobs and the flexibility of employers become crucial variables. Experience shows that for those individuals who return to work successfully, the employers and supervisors are likely to possess certain qualities. First, they are willing to talk with the vocational counselor to understand the strengths and limitations of the client, and to "give them a chance." Second, they are flexible in their expectations of the client, and are more inclined to notice the clients' abilities than the inevitable peculiarities of the "head injured behavior." Third, they are not "on-guard" for the first sign of trouble as a trigger for dismissal but rather they work with the counselor after the client is hired to smooth out and solve difficulties that arise. To find the proper blend of job and cooperative employer for the head injured person takes considerable perseverance and insight. The availability of such a situation is an important factor in long-term functional improvement.

Environmental Changes

The final factor in long-term improvement consists of changes that may occur in the head injured person's environment. Such changes can result in spurts of functional improvement, or severe setbacks. Conflicts at home may force the person with a head injury to find an alternative living situation, as may the death of an elderly parent. Such "crises" can precipitate either a more restricted, dependent lifestyle, or they can become the occasion for increased autonomy and opportunity. Often the formation of a close relationship will provide the motivational surge that propels the person into new social contacts and renewed belief in him or herself. A peer support group may have the same effect. The very act of going beyond one's own walls and becoming socially engaged can trigger functional improvements long after an accident.

On the negative side, environmental changes can also send a person with high functioning into a tailspin. Sometimes a new boss or peer at work can upset a successful but delicate balance, and the persons will find themselves fired after years of satisfactory, successful employment. The loss of a close relationship can precipitate a depression which is often coupled with heavy drinking. Such a combination can seriously compromise the level of functioning of a person with head injury. Under the influence of new "friends," the anxious or depressed person may begin using drugs, with similar consequences: a breakdown in self-discipline, structure, and loss of job. (It must be remembered that individuals with head injury usually have a severely decreased tolerance for drugs and alcohol, and become debilitated by their effects extremely quickly.)

CONCLUSION

It takes a great deal of work to prepare the person with a head injury and the environment to create a situation where improvement is maximized and the person is operating at his or her fullest potential. The sad fact, however, is that even when this point is achieved, "rehabilitation" is not complete. It might be for the spinal cord patient or amputee, but not for the head injured person. The reality of head injury is that any situation is tenuous and temporary. Successful rehabilitation requires ongoing monitoring of the situation, timely interventions when they are needed to keep things from falling apart, or (more positively), to grasp the opportunity to move ahead. The successful rehabilitation counselor will monitor the person's situation closely, and be alert for potential problems. On the other hand, effective rehabilitation counselors will also keep in close contact with clients who up to now have not been able (or ready) to negotiate employment successfully. They continue to look for the changes in the person, family, and environment that signal opportunity for growth.

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Chapter 3

PROBLEMS NEEDING SOLUTIONS
A Consumer and Family Perspective

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CONSUMER ISSUES

How does it feel to have a head injury? Perhaps a first hand account will be of benefit in achieving an understanding of this experience:

> Having a head injury means always comparing yourself to who you were pre-injury. It is the fear that people are not telling you that you are not as smart as you were before, maybe now even retarded. It means always rehashing conversations in your mind, wondering if you said the right thing, sometimes discovering that you did not, and wondering what the other person thought about your awkwardness. It means talking to people and continuously finding a large space in your mind where the word you are desperately searching for was there just a moment ago. It means trying to explain to people what being head injured means and why you do some of the things you do only to have them say, 'Sometimes I can't think of a word.' or 'There are a lot of things I forget too.' When people respond with statements like this there is the lonely feeling of not being understood once again or the urge to ask when it was that they hit their head.
>
> It means becoming frustrated at your ability to get anything accomplished because you get distracted from one task when you remembered that another has to be done. At the end of the day your accomplishment is several unfinished projects. It is the fear of being a burden to others.

The above first-person's account is one person's feelings about what it is like to know you are not the same person you were prior to the injury. It describes the frustration of loss of ability and confidence in oneself. These thoughts, given as background, indicating in general terms the problems faced by individuals who sustain traumatic brain injuries. The following chapter sections will discuss specific problems faced by persons who sustained traumatic brain injuries.

Past Self

One of the most difficult problems following brain injury is coping with the memory of one's past self. The ability to remember people and events from the past may have vanished. The ability to remember something that was just said, may be lost. However, in almost every case the client's memory of the person he or she was before the injury remains. The memory of the **past self** often becomes idealized and the ultimate goal of the person with TBI may be to once again become the person he or she believes existed prior to injury. It is, therefore, necessary for the counselor to gain an understanding of the client's pre-injury personality, lifestyle, hopes and dreams as well as his or her present

perception of these factors. Whether or not it is realistic for a client to hope to return to a perceived pre-injury state, it may often be the strongest motivation for rehabilitation. A counselor, aware of this source of motivation, may use even these unrealistic expectations in a constructive fashion to accomplish realistic goals.

It should be added that unrealistic goals may be used constructively, without being disparaged. Acceptance of even obvious limitations may be extremely difficult for a person with TBI. It is a long and bumpy road to learn about and accept the different but similar person he or she has become. For many, it is easier to accept limitations learned through guided failures rather than through the haphazard failures that may make the rehabilitation process more difficult (such as failing at school, getting fired, getting arrested, lost friendships, and other changes).

Acceptance of Limitations

Acceptance of limitations is often hindered by the use of denial as a coping mechanism. Denial protects the client from the rude reality that things will never be the same and may, in fact, be radically different than before. TBI happens in an instant and affects all areas of a person's life. It is often easier (and psychologically healthier) to utilize denial as a primary coping mechanism initially; later, gradual acceptance of important changes may take place. If an individual was forced to accept at once all the changes that were brought on by a TBI, the resulting distress could be more painful (and undesirable) than any negative consequences of denial. Nonetheless, at some point in the adjustment process denial must be confronted if acceptance and growth is to take place.

Another factor, which may inhibit acceptance of limitations and losses, is lack of insight. This can be a consequence of the injury itself, depending upon the particular areas of brain damage. Injury to the frontal lobes is an extremely common consequence of TBI, and almost always results in some sort of loss of ability to judge accurately important aspects of one's own behavior. This may be reflected in difficulty in identifying limitations, or in evaluating one's ability to conform to some standard. For example, one may overestimate the speed or accuracy of performance of a task, fail to identify errors, or underestimate the significance of problems or mistakes. The degree to which such problems exist for a particular client with TBI may vary greatly, as may ability to improve. For one individual with TBI, it may require several failures to recognize a limitation; another person may never gain this recognition no matter now many failures are encountered, even when they are of great personal consequence. Such failures of recognition may well reflect organically based limitations in ability to acquire this type of knowledge through experience.

It is of great importance that the vocational rehabilitation counselor be aware of the presence of any lack of acceptance. The cause may be denial or

limited insight as discussed above, or a combination of the two. If a counselor does not have a good grasp of the client's degree of acceptance of the "changed self," and the reasons underlying any lack of acceptance, false expectations on the part of the counselor and client may result in an unsuccessful rehabilitation outcome. For example, a client may be frankly unaware of problems with organizational skills, memory and/or distractibility. The client may insist that he or she is capable of success in college course work. Even though the counselor may realize that this client has a seriously limited chance of success, a carefully planned trial of college course work may be a valuable tool to allow the client to confront limitations directly. Indeed, such a trial may be necessary, with appropriate guidance and support, to change the client's expectations and acceptance of self.

It should also be mentioned that acceptance of strengths may also be very difficult for a person with TBI. This may be caused by the belief that everything accomplished after TBI is never quite "good enough." Comparison of life after TBI with the usually idealized life before TBI is common. However, it is frequently self-defeating, because many individuals tend to minimize their accomplishments following TBI. Sometimes even major accomplishments such as resumption of walking may be diminished by an unfavorable comparison to the same activity prior to injury.

Interpersonal and Social Behavior

In addition to difficulties with insight, the individual with TBI may also experience changes in other important aspects of psychological functioning as a direct result of brain injury. In particular, significant changes in interpersonal skills may be demonstrated. The person with TBI may have difficulties in relating effectively with co-workers, bosses, job coaches, vocational rehabilitation counselors, or social acquaintances. Social behaviors may be inappropriate, impulsive, or unusual in some way. Control of temper may be a particular problem. The net result of such changes in social skills may be a loss of satisfying social relationships, or abandonment by family or other supportive social network. Too often, loneliness (and in some cases, depression) can result. Under such circumstances of psychological stress, abuse of alcohol and other drugs may become an associated problem, which may aggravate an already troubled life.

Initiation

Other psychosocial problems, which may emerge, include impairment of self-motivation or initiation. Such problems, frequently associated with frontal lobe injury, may also be incorrectly interpreted as representative of laziness, or lack of interest in the rehabilitation process, when in fact they may represent specific consequences of TBI. Problems in this area, together with other cognitive impairments in such areas as reasoning and memory, can lead to

significant problems in decision-making, resulting in poor decisions, or even no decisions.

AODA - Alcohol and Other Drug Abuse

It is well known that many individuals sustain TBI as the result of alcohol-related accidents. Some individuals with TBI have a preaccident history of alcohol or other chemical abuse. With or without a prior history, individuals with TBI may be vulnerable to the development of substance abuse because of many factors. Such factors as emotional distress, social isolation, and boredom heightens this vulnerability. A decreased physiological tolerance to chemicals along with reduced self-monitoring capability may also compound the substance abuse problem for the client with TBI. Problems in this area most often require referral to appropriate professional specialists for evaluation and intervention (see Chapter 6).

APPROACHING THE PROBLEMS

How may the vocational rehabilitation counselor respond effectively to such an array of problems? First, and foremost, is the development of an awareness of the basis of such problems. It may be particularly damaging when such problems are inappropriately labeled as indications of stubbornness, uncooperative behavior, lack of interest in rehabilitation, poor motivation, or simple laziness, instead of being recognized as predictable consequences of TBI. Ironically, such inappropriate labeling can serve to effectively exclude a client with TBI from services precisely because of the problems which are a consequence of head injury! Thus, awareness of such problems as part of the typical picture of disability after TBI is critical. The difficulties must be seen as problems to be solved rather than only as obstacles to the rehabilitation process, or worse, as reasons for termination of much-needed services.

Along these lines, persons with the constellation of common problems after TBI may require special approaches to achieve success in the vocational rehabilitation process. In particular, such clients may require more aggressive intervention and follow-along by the vocational rehabilitation counselor than other clients, in order to provide an increased level of structure. For example, scheduling and keeping appointments may need to be more of a shared responsibility between client and counselor than is typically the case. The counselor may need to help the client with TBI compensate for problems in such areas as memory, organizational abilities, and/or initiation. Considerable skill on the part of the counselor is necessary, however, in order to avoid a patronizing approach.

Some problems of the individual with TBI may require specialized professional intervention. Compensation for cognitive deficits represents one such area, while clinical depression and AODA problems represent others of this

type. For problems in adjustment, acceptance, and community re-entry, referral to peer support groups may be an appropriate option to consider, adjunctive to professional intervention. As noted earlier, the creative and judicious use of guided, well-supported life experiences with the possibility of failure may be useful (and in some cases necessary) to assist some clients achieve needed insight and acceptance of problems. Such practices will likely be best employed in consultation with a knowledgeable and experienced mental health professional. Well used, such an approach may enhance motivation as well as acceptance and/or insight.

To summarize, the vocational rehabilitation counselor may consider the following questions in working with an individual with TBI:

1. What is the client's perception of his/her limitations?

2. What problems are related to the TBI? Which were pre-existing? How did TBI affect the pre-existing problems (e.g., AODA, strength of support system, personality traits)?

3. Who or what does the client wish to be?

4. Have pre-injury goals changed?

5. How may unrealistic goals be used to accomplish realistic goals without inhibiting motivation?

FAMILY ISSUES

The National Head Injury Foundation (NHIF) states that, "Traumatic brain injury happens to a family." Rehabilitation cannot be successful without including the client's family or support system. When a family member is brain injured the equilibrium of the whole family is disrupted by changes in roles, family goals and plans, and changes in financial resources and expenses.

First of all, a TBI can, and usually does, greatly affect a person's ability to continue acting in their pre-injury family role. A man who is the primary income earner may suddenly become unable to earn any income and may need constant care from his wife, much like a child. A twenty-year-old who has become independent, living on his/her own, may suddenly return to dependence upon the parents. The emotions involved in family role changes are likely to be intense on the part of both the person with TBI and the other family members. Along with role changes, there are changes in financial conditions. If the person who suffers a TBI is an income earner, there may be a significant loss of income. Even if there is no loss of income, there will be added expenses. Insurance, if there is any, may not cover all medical and out-of-pocket expenses. There may also be legal fees, depending on the cause of the injury. These

financial difficulties can cause a change in lifestyle or social class for the whole family, in turn causing more stress on the family system.

Changes in roles and finances precipitate changes in family plans and goals. A couple that planned an early retirement may have their plans dashed when they have to resume the care and support of an adult son or daughter. Their life savings may be used for rehabilitation of their child and comfortable retirement may become impossible because of the added expense of caring for a dependent.

Families also experience difficulties in long-term adjustment. In a number of reports of long-term follow-up by Brooks et al. (1984), the concept of "family burden" has emerged. This concept takes account of the problem and life stressors in postinjury adjustment described by family members of individuals with TBI. Problems in physical functioning tend to be regarded as relatively low priority issues of concern. However, families consistently identify the changes in the family member's behavioral and emotional functioning as the most distressing changes experienced, and those which are particularly difficult to cope with over the long term. Thus, such difficulties are frequently sources of significant and enduring stress for families.

Needs of Survivors

In reviewing family issues, information from the Wisconsin Study of Survivors of TBI (1988), conducted by the Brain Injury Task Force of the Wisconsin Department of Health and Social Services, is of interest. This survey obtained responses from the family or significant others of a fairly typical group of individuals with TBI, namely, young individuals (mean age = 31), primarily male (69.2% of 715 respondents), single (72.4%) with chronic disabilities (average response 6-1/2 years after injury) resulting from a motor vehicle accident (64.2%). Most of the individuals with TBI were severely injured, with an average period of unconsciousness of 28 days as reported by a significant other. Significant physical, cognitive, and behavioral problems were identified for this group. Most showed fair independence in activities of daily living, and most (67%) were living outside institutions (independently or at home with supervision). However, despite the fact that most respondents were community-based, the majority of those living outside of institutions (55.7%) had either not received or even applied for vocational rehabilitation services. Substantial numbers of these individuals were considered to be in need of vocational training (21.4%), job placement and follow-along services (24.5%), or supported employment (17.9%), but had not received these services. Not surprisingly, since most of these individuals were financially self-supporting prior to injury, a high percentage (81%) were judged to have sustained a substantial or severe reduction in long-term earning potential.

Clearly, as a group, these individuals were demonstrating substantial difficulties in vocational re-entry on their own or even with family help.

Prospects for success without some professional vocational rehabilitation intervention appear extremely unfavorable for this group. These individuals and their families feel they require assistance, and must be identified in an aggressive way in order to link appropriate individuals with sorely needed services. This points to the need for vocational rehabilitation agencies to develop means of proactive service delivery. For example, vocational rehabilitation agencies may develop and cultivate relationships with physicians and other health care providers to make them aware of vocational rehabilitation services, and the willingness of vocational rehabilitation counselors to serve individuals with traumatic brain injury.

Family Coping Styles

Adjustment to the changes brought on by TBI is affected greatly by the family's coping style. There are many styles, but most families fit into one of four general categories: unsupportive; supportive; overly supportive; and dysfunctional family.

Unsupportive family. Denial characterizes the unsupportive family. This type of family is likely to expect a quick return of their family member to pre-injury status. They may be likely to believe the notion that once physical healing takes place everything will be fine. Limitations caused by TBI may not even be acknowledged. If a problem is seen, they may blame it on the client's lack of motivation (laziness) or accuse the client of malingering.

It is unlikely that the unsupportive family will give much support either to the client or the rehabilitation process. In fact, they may impede progress by confirming the patient's self-defeating thoughts (e.g., that problems are the individual's fault - not the result of TBI). Although it is necessary to include the family in the provision of services, it may be wise to limit the involvement of an unsupportive family.

Supportive family. A supportive family aids the rehabilitation process. They are able to see the changes in their family member that are due to TBI and to have more realistic expectations than the unsupportive family. They are willing to do what they can to facilitate rehabilitation and/or acceptance.

Supportive family members are more likely to seek out information and help for themselves and the family member with TBI. Their goal is to help the client increase independence and are willing to allow the client to risk failure. It is important to encourage the support and involvement of a supportive family when providing services for their family member.

Overly supportive family. A third type of family, often particularly difficult to deal with, is the overly supportive family. This type of family may

become overly supportive as a result of guilt (they may feel they could/should have prevented the accident) or because they enjoy the sense of power they have with the client in a dependent role. As a result, the family becomes overly protective of the family member with TBI and promotes dependence. Recovery becomes difficult because the family protects the client from failure and negative feedback.

Success in rehabilitation is also something the overly supportive family may be wary of because it means increased independence for their family member. They may fear letting go of the care, responsibility, and influence they have in their loved one's life.

Another characteristic of the overly supportive family is that they tend to view all the client's problems as results of the injury. They may somehow forget the client's pre-injury negative personality traits such as explosive anger, high risk taking behaviors, or alcohol abuse. They may also forget, as may the client, that life was not perfect before the injury.

Dysfunctional family. A dysfunctional family may be characterized as one with problems in communication and difficulties in making changes. Such a family will typically be ineffective in coping with life stresses. A family that was dysfunctional before an injury will have a difficult time providing any amount of healthy support for an injured family member. Therefore, it is important to gain an understanding of the pre-injury dynamics of the family and the effect the injury has in this area.

Clients without families. In many instances, a client seeking help has no existing family. In this case, it is important to discover if the client had any social support system prior to pre-injury. However, it is very common for nonfamily support systems to weaken after the initial crisis of the injury.

A client with no/little support system will need more encouragement, and probably more services from the service delivery system.

Family Involvement

Involvement of the family is critical no matter what its coping style. It is important to help families help their family member. Some of the ways this can be done is through education, involvement in rehabilitation decisions, counseling, family (peer) support groups, and referral to other agencies.

Education may make all the difference in the world for a family. A family may respond as they do because they lack knowledge about traumatic brain injury. Information about TBI and appropriate expectations should be readily available as well as referral to an appropriate source, such as NHIF, for answers

to questions. Another great help to families is referral to agencies that can be of further help in specific areas such as TBI support groups, marriage counselors, Independent Living Centers, AODA assessment, etc.

Related issues. Prior to successful completion of vocational goals, some other issues often require prior or simultaneous attention. Housing is one of these issues. Often a satisfactory, long-term housing solution has not been finally determined by the time vocational issues are addressed. Initial determination of such issues as degree of client independence, location, and need for public transportation options will often be required, and may impact on vocational decisions. Funding resources and options must also be evaluated and considered. Family issues may be important here as well, since family members may harbor an agenda favoring or opposing particular housing options, for a variety of reasons which may or may not be readily apparent. Family support in these matters is often critical. In conjunction with housing, issues of transportation are often significant in relation to vocational considerations. Will the client be a candidate for independent driving? Will he or she be capable of independent use of public transportation? Will special training be necessary to achieve either goal? If so, it may be important to identify special resources for driver training or community mobility training.

Finally, recreational and social needs will need to be addressed in considering the broad spectrum of community re-entry. Without the availability of appropriate and satisfying social activity and support, even the best vocational rehabilitation plan may fail.

Family relations with vocational rehabilitation. Not infrequently, a client's family may be unfriendly, or even hostile, to the providers of vocational rehabilitation services. This may be the result of negative stereotypes of vocational rehabilitation service providers, or may be the result of an earlier "bad experience". Nonetheless, in most circumstances, it will be useful to involve families as much as possible in the rehabilitation process. Families as well as clients should be educated, informed, and involved, assuming client consent. An uninvolved family may hinder the vocational rehabilitation counselor's effort, even inadvertently; the result may be rehabilitation failure. If a family is difficult to work with, it may be possible to find one supportive family member; working with that person may eventually induce cooperation from other family members.

One particular area in which family members may be particularly useful is in the role of case manager. Coordination of services is often a critical role, yet it often goes unfilled in the frequently fragmented world of community-based rehabilitation services. A family member may be able to fill this void. Certainly, not all family members are able or willing to take on such a role. However, most vocational rehabilitation plans will require orchestration and

coordination of a wide variety of services and agencies, and as noted this role can be crucial to vocational rehabilitation plan success. Incorporation of a key family member into this critical role may serve the dual purpose of insuring that the family is informed and involved, while at the same time filling an essential but often unmet role in the overall rehabilitation plan.

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Section II

EVALUATION OF PERSONS WITH TRAUMATIC BRAIN INJURY

Chapter 4

THE NEUROPSYCHOLOGICAL EVALUATION

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The neuropsychological evaluation provides an extensive and comprehensive assessment of an individual's cognitive, emotional, social, and behavioral assets and liabilities following brain trauma. This information can be quite useful to the vocational counselor as the vocational plan is developed with the client who has brain injury.

The breadth of the neuropsychological evaluation goes well beyond that of a standard psychological evaluation. The neuropsychological evaluation has demonstrated sensitivity to the effects of brain injury (Grant and Adams, 1986). As compared to a psychological evaluation, a neuropsychological assessment provides a comprehensive profile of specific cognitive abilities.

Some comparisons between the neuropsychological evaluation and a psychological evaluation are in order. A psychological evaluation typically includes an assessment of intelligence and academic abilities. In adults, intelligence and academic skills are judged primarily by how well they can remember information and skills that they learned long ago, as children or adolescents, and have practiced to some degree ever since. This type of old learning (called **remote memory**) is often not affected by brain injury. For example, a person with brain injury may vividly recall events of high school from years ago, but is unable to recall what was served for breakfast just a few hours ago. Old memories are well established and tend to be resistant to all but the most severe brain injuries. Following brain injury, IQ and academic skills may be average, even though significant deficits are present in abilities required to learn and remember new information, to attend and concentrate, to organize thoughts for effective communication, to solve visual-spatial problems, to reason abstractly, to come up with solutions to problems, to understand social situations and demands, and to monitor and regulate personal behavior. The neuropsychological evaluation provides an assessment of this broad range of human functions. In contrast, a standard psychological evaluation of intelligence and academic skills only tells what the client has learned up to the point of the head injury. A standard psychological evaluation tells little about the client's specific cognitive disabilities or the ability to process new information. A psychological evaluation can be expected to identify emotional problems. However, a good neuropsychological evaluation will analyze how emotional and behavioral problems relate to the brain injury and impaired cognition. Understanding such relationships can lead to specific recommendations for treatment and remediation.

TYPES OF NEUROPSYCHOLOGICAL ASSESSMENT

There are several major approaches to the neuropsychological evaluation. Some neuropsychologists define their practice according to a particular method. Others are more eclectic and borrow from several approaches. Three major approaches to the neuropsychological evaluation will be briefly presented.

These methods are described in more detail by Grant and Adams (1986) and Filskov and Boll (1981).

Halstead-Reitan Approach

The Halstead-Reitan approach is characterized by the use of a rather long battery of tests (often taking 6 to 8 hours to administer). The Halstead-Reitan battery thoroughly assesses a number of areas of cognitive function, but has been criticized for not thoroughly assessing new learning and memory abilities. Most practitioners in the Halstead-Reitan tradition include additional measures of learning and memory in their evaluation of individuals with traumatic brain injury. Of all the approaches to the neuropsychological evaluation, the Halstead-Reitan method enjoys the largest amount of scientific documentation of its validity in identifying brain damage and localizing brain lesions.

Luria-Nebraska Approach

Before his death, the prominent Russian neuropsychologist, A. R. Luria, developed a distinctive approach to neuropsychological evaluation. Anna-Lise Christiansen collected and described his methods in detail. The Luria-Nebraska battery is a collection of short tests based on Luria's work and the elucidation of his methods by Anna-Lise Christiansen. The Luria-Nebraska battery takes only about half as much time to administer as the Halstead-Reitan, but can be criticized for less thorough evaluations of cognitive abilities, particularly of higher-order abilities involved in reasoning and planning. Scientific studies have demonstrated the validity of the Luria-Nebraska.

Boston Approach

The Boston approach emphasizes observation of the patient's behavior in determining the presence of brain impairment and specific brain lesions. A neuropsychological evaluation conducted in the Boston manner includes psychometric testing. However, the evaluation will place more emphasis on behaviors which the client exhibited in performing the tests than on the test scores alone in determining the presence of general or specific brain damage.

THE NEUROPSYCHOLOGIST

All of these approaches provide valid means for determining not only the presence of brain damage, but also which specific cognitive abilities have been affected. The neuropsychologist's evaluation is based on an assessment of the client's cognitive, emotional, behavioral, motor, and sensory abilities. By using knowledge of the relationship between specific abilities and the function of specific brain regions, the neuropsychologist can make some determination of the location of brain damage. Although this type of information is usually of more interest in medical evaluation and treatment than in vocational planning,

the neuropsychologist can offer an opinion about whether the brain injury has affected brain functioning generally or has primarily affected only a specific area of the brain.

The assessment approach the neuropsychologist takes is less important than skill in interpreting evaluation results. At present, the practice of neuropsychology is still part art and part science. Attempts to write a computer program that will offer a valid interpretation of neuropsychological test results have not been successful to date (Adams and Brown, 1986). This is important for the vocational counselor to know since computer programs to interpret neuropsychological test results do exist and some psychologists who are not well trained in neuropsychology may base their "neuropsychological" evaluations on such computerized test interpretations. Such reports may be inaccurate and misleading.

Even the best neuropsychological evaluations have limitations. No evaluation can assess all abilities or features of a person. In addition, people and their abilities can change over time. An evaluation conducted a year ago may not accurately represent the capacities and personality style of the person with brain injury today. Furthermore, no report can be exhaustive. It would be ridiculous for a neuropsychologist to attempt to report the full range of neurological, rehabilitative, legal, emotional, behavioral, personal, interpersonal, vocational, and avocational implications of his findings in a single report. The report would constitute a small book and no one would have the patience to read it!

In reality, reports are focused to address specific referral questions. Diagnostic and prognostic issues are stressed to meet the needs of medical referral sources. Vocational and educational considerations are emphasized in reports for vocational rehabilitation counselors. Even within the sphere of vocational rehabilitation, however, relevant implications of the neuropsychological evaluation can become quite extensive. Emotional, interpersonal, avocational, and familial factors assessed as part of the neuropsychological evaluation may be important to success at work. In addition, the cognitive and behavioral factors that are directly related to job performance or the potential for training should be highlighted.

The best focused neuropsychological consultation is in fact a relationship between the neuropsychologist and the vocational rehabilitation counselor. The vocational rehabilitation counselor sends the client for a neuropsychological evaluation with a few specific referral questions. In addressing these in the evaluation, the neuropsychologist may ask the vocational counselor for additional information. The counselor often has information (e.g., school records, social history, vocational history) about the client that is very helpful in assessing changes in the client's abilities. Once the counselor receives the neuropsychological report she or he should contact the neuropsychologist with

additional questions and concerns. The counselor may have made observations of the client that seem to contradict some of the findings of the neuropsychologist. An open discussion of these areas of disagreement will often lead to a better understanding of the client by both the counselor and the neuropsychologist. In the long-term, the neuropsychologist should be available to both the vocational rehabilitation counselor and the client for additional consultation as the vocational plan proceeds and new issues arise. Sometimes ongoing consultation will require re-evaluation, but often times, such consultation can be based on prior evaluation and knowledge of the client.

A COOK'S TOUR OF THE NEUROPSYCHOLOGICAL EVALUATION

To encourage this type of give-and-take, between the vocational counselor and the neuropsychologist, this section offers a review of the major domains assessed in a comprehensive neuropsychological evaluation from the perspective of possible referral questions for the neuropsychologist. For each domain addressed by the neuropsychological evaluation, possible referral questions will be listed followed by a brief discussion of issues on which the questions are based.

Attention and Concentration

1. How is the individual's ability to focus attention for **brief periods**?

Individuals with moderate to severe brain injury may have intermittent difficulty even focusing attention for a few minutes. They may appear inappropriate or "spaced out" at moments when they have lost their concentration. This type of impairment will rule out many jobs for the individual. However, work that can be done at an irregular pace may be possible. The employer and other employees need to understand that the client's inattention is related to the brain injury and not to poor motivation. Driving is probably hazardous (even though the individual might pass a brief driving exam) and alternative methods for getting to work need to be explored.

2. Will attending selectively or under distracting conditions be a problem?

In cases of milder brain injury, an individual may focus attention and generally appear to be alert and able to concentrate. However, the individual may have significant difficulty when more complex attentional processes are required. Persons with brain injury may have difficulty attending selectively to a task when distractions are present. Some examples of selective attention are:

- Working under noisy or distracting conditions
- Listening to one person when others around are also talking

- Quality control (finding an error)

3. How is the client's ability to divide or shift attention?

Persons with brain injury may have difficulty dividing attention or shifting attention between two tasks. Some examples of divided or shifting attention are:

- Keeping two conversations going at the same time (e.g., with a receptionist and salesperson)
- Comparing columns of financial figures
- Working on two projects or tasks simultaneously (e.g., auto mechanic who also has to mind the pumps)
- Radio dispatcher
- Urban driving

4. Will sustaining attention be a problem?

After a brain injury, individuals may also be unable to sustain attention reliably for long periods of time. Some examples of sustained attention are:

- Monitoring (e.g. medical, radar, dispatcher)
- Some assembly line work
- Long-distance driving

5. Would evaluation of current medications or a trial of new medication possibly increase attention?

The neuropsychologist cannot answer this question independently, but may advise neurological consultation if he or she believes the patient's current medication regimen may have an adverse effect on the patient's attentional abilities. For example, if the person with brain injury needs to be on medication for seizure control, a change in the type or dosage of antiseizure medication may improve attentional abilities.

6. Would attentional rehabilitation be of benefit?

Sohlberg and Mateer (1989) have developed behavioral training methods for improving attention. They have provided preliminary evidence of the effectiveness of their methods both for improving the ability to concentrate and secondarily for enhancing learning and memory. While these training procedures may not be applicable to all individuals with attentional problems, they should be considered as a possible avenue for treatment.

Learning and Memory

An important distinction must be made between the client's ability to

remember information that was acquired before the brain injury and the ability to learn and remember new information. As has been mentioned previously, in many cases of brain injury, memory for information learned prior to the injury (remote memory) is intact, but the ability to acquire new information (recent memory) is significantly impaired.

Recent Memory

1. How much new information can the individual retain after a delay of 30 minutes to an hour?

Clients with good alertness and the ability to focus attention briefly, may recall new information well immediately after presentation. However, retention of the new information still may not be reliable. Impairment in delayed recall is usually more obvious for unstructured information (e.g., random word list) than for structured information (e.g., paragraphs). If retention memory is severely impaired, problems will be obvious even in familiar situations and can create hazards, such as leaving dangerous equipment on or forgetting to take appropriate safety precautions.

Staff and family are often surprised when individuals with recent memory problems learn to perform repetitive tasks, although they cannot always explain the task or remember how they learned the task. Even totally amnestic individuals (persons who have no ability to remember new information) have shown the ability to learn repetitive sequences of behavior that are sufficient for performing some jobs (Schacter and Glisky, 1986). Use of memory aids and compensation techniques (e.g., notebook, datebook, alarm watch) by the client with deficits in new learning are recommended to enhance the potential for successful employment.

2. Do new learning and memory problems apply to simple information (e.g., appointments, instructions) as well as to complex information (e.g., academic learning)?

Individuals who can learn and remember simple information can probably also learn new information that is related to knowledge acquired before brain injury. They still may have difficulty acquiring complex, unfamiliar information. Such individuals usually retain at least average verbal intelligence. They often can successfully return to a former job, which requires only a little additional learning over time, although a former job which requires constant relearning (e.g., insurance sales, engineer, computer programmer) is usually out of the question. Much in the way of additional book-oriented, non-hands-on academic training is probably inadvisable for the person with deficits in the recall of complex information, even if the individual retains a high IQ.

Difficulties in remembering complex, unfamiliar information may not be at

all obvious when the disabled individual is functioning in routine, overlearned tasks, or when in familiar environments. But this type of memory disorder is often painfully obvious when the individual must acquire new information or learn to function in unfamiliar situations. Nonetheless, memory rehabilitation can be most successful with this type of case.

3. Would use of compensation techniques and memory aids benefit the individual? Is a trial of memory rehabilitation indicated?

There are two basic approaches to memory rehabilitation. One is to teach the person strategies that increase learning efficiency. Mental imagery or study skill techniques are examples of such strategies. The second approach emphasizes the use of compensation techniques, such as a well-organized notebook. The two approaches are not mutually exclusive as both may be used together. Although some research has demonstrated the effectiveness of memory rehabilitation (Goldstein, McCue, Turner, and others, 1988; Gouvier, Webster, and Blanton, 1986), there is considerable controversy about the effectiveness of memory rehabilitation. For instance, Kay and Lezak present a somewhat different viewpoint of memory rehabilitation in Chapter 2 of this book.

Remote Memory

1. How much can the individual rely on remotely learned information, such as is indicated by verbal intelligence and basic academic skills?

Average or high intelligence constitutes a resource for persons with brain injury, even though they may still have significant problems with attention, memory, reasoning, judgement, planning, insight, social skills, etc. Typically, IQ scores are not affected by mild to moderate head trauma because IQ depends so highly on remote memory. Low average or below average intelligence usually indicates moderate to severe generalized cognitive dysfunction (affecting all areas of cognition). Such scores indicate very significant functional limitations for the individual, unless of course pre-injury intelligence was at this level and the person has already adapted to these limitations.

Recognizing and pronouncing single words (such as required by the Wide Range Achievement Test - Revised) is another indicator of pre-injury intelligence and remote memory. The ability to pronounce single written words is usually intact after milder head injury. If impairment does exist in the recognition of written words, this may indicate a language disorder.

Impaired reading comprehension is frequently associated with impairment of memory and higher-order abilities. At least average reading comprehension is probably necessary for much in the way of further academic training. Enrollment in a study skills course and remedial reading may help impaired

individuals succeed in further training which requires only a little "book learning." Incidentally, study skills training is also a good approach for improving organizational abilities.

Arithmetic abilities are another indicator of premorbid fund of information, but may be compromised secondary to attentional deficits or spatial problems. Even simple math can require spatial manipulations, as in the process of carrying over. Some occupations (e.g., bookkeeping, accounting) are out of the question for individuals with poor arithmetic skills. On the other hand, hand-held calculators can allow many individuals to achieve a functional level in math. Arithmetic abilities that are much below average raise additional concern about basic independent living skills. Remedial work may be necessary to support everyday money-management and consumerism.

2. Are there discrepancies between verbal and nonverbal intellectual abilities? What do these mean?

Verbal IQ depends primarily on two factors: 1) the ability to focus attention to auditory information, and 2) recall of information usually acquired in school and during early socialization. This latter, remote memory component is primarily an indicator of pre-injury fund of information. Verbal IQ scores are not that great an indicator of verbal reasoning ability. If Verbal IQ is low, it may represent a deficit in either the attentional component or the remote memory component.

The remote memory component of Verbal IQ may be low for several reasons. It may indicate a language disorder. That is, the person can recall the information, but cannot express it properly. Low average Verbal IQ may be present for individuals with average intelligence who did not apply themselves in school because of adjustment problems. Low Verbal IQ relative to Performance IQ may also have been present prior to injury for individuals who were mediocre in school but were successful at jobs which emphasized visual-spatial skills (e.g., hair stylist, mechanic). Even more so than overall IQ, low or below average Verbal IQ can indicate moderate to severe generalized cognitive dysfunction (affecting all areas of cognition) which will result in very significant functional limitations for the individual.

Performance IQ depends on a number of factors. If Performance IQ is significantly lower than Verbal IQ, it may be due to impaired visual-spatial skills (i.e., perception, manipulation, or construction of visual representations in two or three dimensions), impaired novel problem-solving (with verbal or nonverbal stimuli), slowness, impaired perception, or attentional problems. Verbal IQ may have been higher than Performance IQ prior to injury for individuals whose jobs emphasized verbal, linear thinking (e.g. accountants, corporate attorneys). If visual-spatial skills are intact, on the job training (OJT) in some occupations

may be a possibility.

Language

1. Does the individual need ongoing language therapy?

Although a focal language disorder (**aphasia**) is not common after traumatic brain injury, it can occur. Individuals with aphasia will benefit from further evaluation and treatment by a speech pathologist. There are different types of aphasia. For example, individuals with mild **expressive aphasia** have difficulty putting their thoughts into words. However, these same persons may understand what is said quite well. Even a mild expressive aphasia is a severe disability in jobs where rapid oral communication is required.

Individuals with **receptive aphasia** have difficulty comprehending what is said. Typically lengthy and linguistically complex utterances will increase difficulties in comprehension. Receptive aphasia often has expressive features as well since the person has difficulty self-monitoring what he or she says. Speech may be quite fluent, but nonsensical. Receptive aphasia can present a severe disability not only in occupations which emphasize communication, but in any job where instructions for job performance are frequently revised. The ability to read instructions is often as impaired or more impaired than the ability to comprehend spoken instructions. Consequently more active forms of instruction (e.g., demonstration, hands-on experience) are suggested for these individuals.

2. How well will the individual be able to comprehend work-related instructions?

3. Are higher-order communication deficits present which will interfere with job performance?

Even though the individual is not aphasic, communication problems may be present. Auditory language comprehension may be unreliable secondary to attentional deficits. Higher-order communication deficits may be present. Therapy to improve organization and the **pragmatics** of communication may be of benefit, but not every speech pathologist has the training and experience to provide such therapy.

Examples of higher-order communication disabilities are:

tangentiality:	not being able to stick to the point in conversation
disorganization:	not being able to make the point one wants to make; starting a story in the middle

garrulousness: being overly talkative and monopolizing the conversation

Examples of conversational pragmatics are:

turn-taking: giving and picking up on the kind of cues that let people know when it is time to quit talking and start listening (and vice versa) in a conversation

prosody: the "music" of speech, proper

inflection: inflection and emotional tone

gestures, facial expression: the nonverbal complements to verbal communication

Speech

1. Are speech disabilities related to language problems?

Impairment in speaking is not necessarily associated with impaired language and cognition, and vice versa. If speech problems are present, evaluation and treatment by a speech pathologist may be of benefit.

Visual-spatial Abilities

1. Are visual-spatial deficits severe enough to interfere with driving or route-finding?

2. Is a nondominant hemisphere syndrome present that includes difficulties in facial recognition and perception of facial expression that will cause interpersonal problems?

3. Would specific visual-spatial therapy be of benefit?

Aphasia is most often present following specific injury of the dominant cerebral hemisphere. For most people, this is the left cerebral hemisphere. Specific injury to the nondominant hemisphere (for most people, the right) most often results in impairment of spatial and perceptual abilities. Because of the diffuse nature of most head injuries, severe visual-spatial disabilities are, like aphasia, present only in minority of persons with brain injury. When severe, spatial problems will interfere with route-finding and probably preclude driving.

Mild visual-spatial deficits may rule out many jobs which require strong visual-spatial skills, such as, mechanics or drafting. However, particularly if

visual-spatial rehabilitation is provided, skills can probably become adequate for most functional activities. There is scientific evidence for efficacy of visual-spatial therapy (Gordon, Hibbard, Egelko, and others, 1985; Gouvier, Webster, and Blanton, 1986).

Even with mild visual-spatial problems, there is concern about difficulties in facial recognition, memory for associations between names and faces, and the perception of facial expression that may cause interpersonal problems. Few neuropsychological measures are available to assess these kinds of skills directly, but neuropsychologists may make comment on them from observation. Further observation of the individual in interpersonal situations may be needed to thoroughly evaluate these types of disabilities.

Fine-motor Abilities

1. How are single-handed and bimanual motor abilities affected?

Single-handed motor performances are often unimpaired following mild to moderate head injuries. Even in these cases, however, difficulties in bimanual coordinated movements may be present. Additionally, the client's ability to sustain an appropriate level of speed in job-related motor tasks may be compromised secondary to attentional problems or nonspecific cognitive inefficiency. Occupational and/or physical therapy may help the client with motoric disabilities.

Higher-order and Executive Cognitive Abilities (Abstract reasoning, conceptualization, problem-solving, self-regulation)

1. Is the individual competent to manage personal affairs and finances?

2. To what degree is initiation impaired?

3. How much is the individual able to structure work personally versus requiring external structure and direction?

4. Will impaired personal organization interfere with the client's sticking to a schedule or routine?

5. Will impaired personal organization interfere with new learning and the capacity to get the "big picture" on a job-related problem or strategy?

6. Will impaired personal organization interfere with goal-setting on the job?

If neuropsychological testing records any degree of impairment in higher-order abilities (which are defined and discussed by Kay in Chapter 2),

problems alluded to in questions 2 through 6 above can be anticipated. With severe impairment, the individual may be unable to competently manage her or his personal affairs or finances. These types of deficits may not be at all obvious in familiar and routine situations, although they can be devastating in the workplace. Deficits in higher-order abilities and social skills, as evidenced by personality changes, are the most significant barriers to re-employment following brain injury (Weddell, Oddy, and Jenkins, 1980). Families are often unaware of these deficits until the individual has been home for a while and been confronted with some critical situations where failures to initiate, problem-solve, and make decisions have resulted in embarrassing or conflict situations.

Deficits in higher-order abilities usually rule out executive employment where getting the "big picture" on situations, problem-solving, and creative decision-making are important, even if the individual retains appropriate job-related knowledge and high intelligence. Occupations where creativity is required are also pretty much ruled out.

On the other hand, do not overestimate the degree to which some "executive level" jobs require creativity. Many middle management and government positions simply require knowing procedures and following them at appropriate times. Individuals in such positions may be unable to advance their careers after brain injury, but may perform competently at the level they had obtained prior to injury.

7. To what degree does impaired insight interfere with the individual's recognizing her or his disabilities and compensating for them?

8. To what degree is emotional self-regulation impaired, e.g., uncontrolled crying or laughing, irritability, angry outbursts? What is the potential for physical violence?

Problems in personal organization may be compounded by limited insight and limited emotional self-control. Following brain injury, a person may be quick to anger and even violent. Some may be socially inappropriate at times and sexually disinhibited. They may be resistant to assistance because of lack of awareness of their problems. This constellation of problems usually is resistant to piecemeal rehabilitation and psychotherapeutic efforts. If these problems can be corrected to a degree that allows for successful employment, extensive (6-12 month), comprehensive, and integrated postacute rehabilitation will probably be required (Prigatano, 1986). Preliminary evidence indicates that such programs result in 50 percent to 60 percent employment following program participation for individuals who were unemployed following a brain injury (Ben-Yishay et al., 1987). Postacute rehabilitation can often be provided on an outpatient basis. If tendencies to violent or potentially self-harmful behavior are marked, residential treatment may be necessary until these behaviors are diminished.

Current neuropsychological measures are not always sensitive enough to capture the types of higher-order cognitive disabilities discussed above. Even though the testing situation is stressful, higher-order deficits may only become apparent under real-life stress. Observations of family, other care providers, and employers are important complements to the neuropsychological evaluation to thoroughly evaluate for deficits at this level of cognitive and behavioral functioning.

Emotional Adjustment and Depression

1. Is depression or anxiety present that will interfere with the client's cognitive abilities?

2. Is depression related to appropriate recognition of disabilities?

3. Is lack of insight into disabilities due to cognitive problems, psychological denial, or both?

4. Should referral for psychological or psychiatric treatment be considered?

Cognitive abilities are related to emotions and feelings and vice versa. As mentioned previously, the individual with compromised higher-order cognitive abilities may have limited insight and limited self-control which result in socially inappropriate and acting out behavior. Persons with brain injury who do have some insight into their problems, however, may become depressed and anxious. They may lose self-esteem as they recognize the losses and disabilities that their injuries have caused. Depression and emotional distress interfere with cognitive processes like attention and concentration for persons with or without brain injury. Clients with brain injury may appear more cognitively impaired than they really are if they are very depressed or anxious.

A period of distress or depression may be healthy to the degree that it marks a time when the person with brain injury is appropriately recognizing disabilities, mourning losses, and learning to adjust to a new situation. A period of depression is expected in the context of a comprehensive postacute rehabilitation program (Prigatano, 1986). Initially persons with brain injury may fail to recognize their disabilities because of cognitive impairment. However, as they start to gain some insight into their problems, true psychological denial may appear as a defense mechanism. If such clients are not receiving ongoing psychological treatment, as part of a post acute program, such treatment should be recommended to assist them through this critical phase of recognizing disabilities, working through depression, psychological denial, and adjusting to a new lifestyle.

Depression may become severe, resulting in extreme sadness, sleep and/or

appetite disturbance, and lethargy. Severe depression may be in reaction to losses from the brain injury, or related to factors that were present prior to the brain injury. In any case, such severe depression may require psychiatric evaluation and treatment, preferably by a psychiatrist who has experience in working with individuals with brain injury. The psychiatrist may recommend antidepressant medication. Clinical experience with patients with brain injury will help the psychiatrist judge appropriate dosages which may be different from those given to individuals without brain damage. Treatment with an antidepressant can facilitate the client's participation in rehabilitation as well as in ongoing psychological treatment directed at helping him or her recognize and adjust to disabilities.

Chemical Abuse and Dependency

1. Will use of alcohol and/or drugs be a barrier to return to work? If so, what type of treatment is recommended?

In a prospective study, Rimel (1981) reported that 55 percent of 1330 patients, evaluated following central nervous system trauma, were intoxicated (blood alcohol level of .10 percent or more) at the time of their injuries. Statistics such as these suggest that alcohol abuse may be a problem for many individuals with brain injury. Abstinence from alcohol or other drugs may also be recommended following brain injury for medical reasons. These chemicals may affect the individual more dramatically than before the injury, markedly interfering with concentration, speed of response, thinking, and impulse control. Alcohol and other "recreational" drugs can also lower the seizure threshold, that is, make it more likely for epileptic seizures to occur in an individual who is prone to seizures because of a brain injury.

Most treatment programs for chemical dependency require clients to identify themselves as persons who are dependent on alcohol or drugs and to abstain from further use of alcohol or drugs. This type of treatment is recommended for individuals who are dependent on drugs or alcohol. Other individuals may have been injured during an episode of chemical abuse, but have no pattern of abuse or dependency. Many times these are young people, with no established pattern of chemical abuse or dependency, who got hurt in the course of some unfortunate experimentation with drugs or alcohol. Such individuals will often resist (quite appropriately) identifying themselves as "alcoholics" or "drug addicts" and will require nontraditional treatment to address their use of drugs and alcohol. Such treatment can be provided as part of the psychological component of postacute rehabilitation.

Family and Social Support

1. Does the client have adequate social support from family or friends?

2. Are distress and psychological denial present among family and close friends to a degree that will create a barrier to the client's vocational rehabilitation?

A client is more likely to be successful in vocational rehabilitation and on the job if encouraged and supported by family and friends. Family and friends are not always able to offer appropriate support, however. They may be so distressed, by the client's injury-related losses (and their loss of the person they knew), that they cannot offer useful support. Family and friends may respond to this distress with defensive psychological denial and actually end up supporting the client's denial and resistance to rehabilitation. Until the situation becomes very painful, some families and close friends convince themselves that the person with brain injury has really not changed much because of the injury.

In fact, the person with brain injury may not be much different in familiar places and situations. In many cases, changes in response may only become apparent when new learning or problem-solving is required. Consequently, the person functions adequately, without major social errors, in familiar situations and interactions with family and friends.

For vocational rehabilitation to be successful, distress and denial on the part of family and friends need to be addressed. Conversely, if clients with brain injury do not have a good system of social support, they will benefit from developing a healthy social network. These issues can be addressed as part of the psychological treatment included in postacute rehabilitation and/or in family therapy. Recreational therapy and referral to a local Independent Living Center can assist in developing a positive social support network. Families may also be assisted in working through their own adjustment issues through participation in a local chapter of the National Head Injury Foundation.

FINDING A NEUROPSYCHOLOGIST

A neuropsychologist is a professional with a doctoral degree in psychology who has additional postdoctoral training and/or experience in the assessment of cognitive, emotional, and behavioral effects of brain damage. Division 40 (Neuropsychology) of the American Psychological Association has adopted the following definition of a clinical neuropsychologist:

> Clinical Neuropsychologist is a professional psychologist who applies principles of assessment and intervention based upon the scientific study of human behavior as it relates to normal and abnormal functioning of the central nervous system. The clinical neuropsychologist is a doctoral-level psychology provider of diagnostic and intervention services who has demonstrated competence in the application of such principles for human welfare following:

1. Successful completion of systematic didactic and experiential training in neuropsychology and neuroscience at a regionally accredited university;

2. Two or more years of appropriate supervised training applying neuropsychological services in a clinical setting;

3. Licensing and certification to provide psychological services to the public by the laws of the state or province in which he or she practices;

4. Review by one's peers as a test of these competencies.

Attainment of the ABCN/ABPP Diploma in Clinical Neuropsychology is the clearest evidence of competence as a Clinical Neuropsychologist assuring that all of these criteria have been met. (Definition of a Clinical Neuropsychologist, 1989).

The field of neuropsychology is rapidly growing, but is relatively new. Clinical neuropsychology has become a recognizable element in health care only in the last 20 years. Because of the youth of the field, standards for training and certification of neuropsychologists are in a developmental process. No state, for instance, offers a special license or certification for neuropsychologists. State licensing in psychology only indicates that a psychologist may practice clinical psychology in that state, and provides no information about the psychologist's competency in the specialty of neuropsychology.

The National Register of Health Service Providers in Psychology is a resource for identifying individuals who are licensed to practice psychology in the 50 states. The National Register also provides some information about particular areas of interest of practitioners listed. The National Register, however, does not appear to be a good resource for identifying neuropsychologists. Slay and Valdivia (1988) surveyed psychologists listing neuropsychology as one of their specialties in the Register and found that a sizeable proportion had rather minimal training in the field. These authors concluded that "it is also apparent that such a listing [as having specialty interest in neuropsychology] in the Register, although perhaps implying much, actually says little or nothing about competency within the specialization (Slay and Valdivia, 1988, p. 328)."

In 1983, a board certification process for neuropsychology was initiated. This board awards a Diploma in Clinical Neuropsychology under the auspices of the American Board of Clinical Neuropsychology and the American Board of Professional Psychology (ABCN/ABPP) to psychologists who meet postdoctoral training requirements and who pass an extensive evaluation of their competencies in the practice of neuropsychology. Board certification in neuropsychology is meant to be a similar process to board certification in

medical specialties, such as neurology or psychiatry. Individuals who are board certified in neuropsychology can be trusted to have satisfactory training and competency in the field. The newness of the board has limited the numbers of individuals who have participated in the evaluation and passed. Presently, there are less than 200 board certified neuropsychologists nationwide.

Given these limitations of licensing and certification processes for identifying qualified neuropsychologists, vocational counselors, particularly those who are not located in large urban areas, may have to rely on local resources to find a good neuropsychologist. University hospitals, other major medical centers, and established head injury rehabilitation centers will usually have a qualified neuropsychologist on staff. State chapters of the National Head Injury Foundation are a good resource for identifying psychologists and neuropsychologists who have expertise in working with individuals following brain trauma.

Ultimately the best indicator of a neuropsychologist's competency as a consultant in vocational rehabilitation is the vocational counselor's own experience with the consultant.

Neuropsychological reports that are of most value to the rehabilitation counselor are those that identify strengths and capacities as well as deficits and that underscore the implications of the assessment for functional abilities and vocational possibilities. A good neuropsychologist will have a broad range of assessment skills and is flexible in approaching assessment problems. Such a person is prepared to evaluate clients with multiple disabilities and can provide assessment services to persons with brain injuries who are also: blind or deaf; have motor disabilities; have a history of psychiatric disorder; or pre-injury learning disability. A good neuropsychologist is able to offer an opinion about cognitive areas of strength and weakness in persons for whom English is not a primary language.

Most vocational rehabilitation counselors seem to work best with neuropsychologists whose orientation, in working with persons with brain damage, goes beyond assessment and includes an interest in vocational rehabilitation. These neuropsychologists are typically not content with a single evaluation, but are interested in following and assisting the progress of the individual with brain injury over a period of time. The most helpful neuropsychological reports identify specific intervention strategies for remediation or compensating for deficit areas. Perhaps most importantly, the vocational counselor will want a neuropsychologist who can participate in an active exchange of ideas, one who will modify his or her assessment and recommendations on the basis of new information provided by the vocational rehabilitation counselor.

In less populated and rural areas, it may be impossible for the vocational

counselor to find a good neuropsychologist in close geographical proximity. A bad neuropsychological evaluation is often worse than no evaluation at all. Such evaluation reports can be misleading with recommendations that either underestimate or overestimate the client's potentials. A good neuropsychological evaluation is worth the trip to a university or major medical center. Recommendations made on the basis of the neuropsychological evaluation can be followed up by local providers (e.g., speech pathologist, occupational therapist, clinical psychologist) in addition to the vocational rehabilitation counselor. Ideally a conference (or teleconference) can be arranged between local providers and the consulting neuropsychologist to discuss the assessment and recommendations in detail.

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Chapter 5

SPECIALIZED EVALUATIONS

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and
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Dr. Smigielski earned an undergraduate degree from Georgetown University in Washington, DC and a Master's degree in psychology at Marquette University. He worked as a psychologist for Milwaukee Public School System and concurrently taught psychology at Marian College. He also worked as a psychologist at Curative Rehabilitation Center, on the campus of the Southeast Wisconsin Regional Medical Center. Contact with individuals with brain injury stimulated his obtaining a doctorate in clinical psychology from the University of South Dakota, with subspeciality in clinical neuropsychology. His internship was at Oklahoma University Health Sciences Center and a postdoctoral fellowship at Braintree Rehabilitation Hospital affiliated with Tufts New England Medical Center and the Boston Veterans Administration. Subsequently he accepted a clinical and faculty position at the University of Wisconsin Clinical Sciences Center, Department of Neurology. Since 1988 he has been at Mayo Clinic as a consultant in the Department of Psychiatry and Psychology. There he works as a Neuropsychological Consultant, participates in the outpatient brain injury program and the inpatient rehabilitation unit at St. Mary's Hospital.

Dr. Malec is a Diplomate in Clinical Neuropsychology, American Board of Professional Psychology. He practices neuropsychology at the Mayo Medical Center in Rochester, Minnesota. He is currently the Program Director for the Mayo Outpatient Brain Injury Program, a comprehensive treatment program to address postacute problems of persons with brain injury. He is also an Assistant Professor in the Mayo Medical School. He completed postdoctoral training in neuropsychology at the University of Wisconsin-Madison and obtained his Ph.D. in clinical psychology from the University of South Dakota. Dr. Malec is active in both lay and professional groups involved with the concerns of persons with brain injury, including the Minnesota Head Injury Association, the Interdisciplinary Special Interest Group for Brain Injury of the American Congress of Rehabilitation Medicine, and the International Neuropsychological Society. He has published and continues to conduct research in brain injury rehabilitation and other areas of neuropsychology and behavioral medicine.

MEDICAL

Clients with brain injury are usually best served by physicians who have experience and interest in working with individuals with brain injury. Clients with brain injury should have a primary care physician (general practitioner or family practitioner) who attends to their ordinary medical problems like sore throat or stomach problems. Following a brain injury, individuals may have difficulty remembering and reporting their medical complaints. So their primary care physician would ideally be someone who is acquainted with and sensitive to the special needs of persons with brain injury.

Supplementing primary care, several medical specialties provide evaluative services that can be of benefit to the person with a brain injury. This section will briefly discuss the most commonly encountered specialty medical evaluations.

Neurosurgeon

A neurosurgeon is a highly trained surgeon whose specialty is in operating on the brain and spinal cord. Clients with brain injury may have had neurological care at the time of initial injury if the injury was very severe. For example, a neurosurgeon may have had to operate to reduce bleeding and remove excess blood from the brain. The neurosurgeon may have also prescribed antiseizure medications for the client. Some clients experience problems like dizziness, headaches, visual or auditory disturbances, seizures, blackouts, or feel that antiseizure medication is causing lethargy or attention problems. If so, and if the client has had neurosurgical care within the last year, the client should be referred back to the neurosurgeon for evaluation. If the neurosurgeon believes that the client's symptoms are not related to surgery or will not be corrected by a surgical intervention, the neurosurgeon may refer the client on to a neurologist.

Neurologist

A neurologist is a physician with special training in evaluation of diseases of the brain and nerves. The client with no recent neurosurgical history who is experiencing problems like dizziness, headaches, visual or auditory disturbances, seizures, blackouts, or problems with antiseizure medication would be most appropriately referred to a neurologist for evaluation.

Both neurologists and neurosurgeons have knowledge of cognitive and behavioral problems associated with brain injury. Consequently, they should be able to evaluate the cognitive and behavioral effects of medications they prescribe. However, with the exception of the rare neurophysician who has developed a specialized interest in working with persons with traumatic head injuries, neither a neurologist nor a neurosurgeon will provide a comprehensive

evaluation of cognitive and behavioral problems. A few major centers may have a behavioral neurologist on staff. This is a neurologist who has specialty training in the way brain disorders affect cognition and behavior. A behavioral neurologist will often work with a neuropsychologist to provide a comprehensive evaluation of cognitive and behavioral sequelae of brain injury. If behavioral neurologists are available, their subspecialty training makes them the best choice among neurologists for referral of clients with brain injury.

Physiatrist

A physiatrist is a physician whose specialty is in the evaluation and treatment of problems with muscles and joints and in the medical rehabilitation of individuals with physical disabilities. Physiatrists are trained to recognize the particular physical and cognitive problems associated with brain injury, provide appropriate care, and coordinate additional services. Following evaluation, physiatrists will often recommend additional medical evaluations as well as further evaluations by a neuropsychologist and by other rehabilitation specialists. For example, they may refer to a physical therapist, occupational therapist, speech pathologist, recreational therapist, and vocational specialist. Because of their role in coordinating services, physiatrists are a good choice for referral of the client with multiple medical and disability related complaints. Physiatrists will evaluate these diverse problems and direct appropriate additional referrals.

COMMUNICATION

Speech Pathologist

Persons with traumatic brain injury may have specific difficulty speaking, expressing themselves verbally, understanding what is said, reading, or writing. Such clients should be referred to a speech pathologist, an expert in evaluating and treating these types of communication problems. A few speech pathologists also have expertise in working with nonverbal communication problems and in the treatment of cognitive problems that are not language related (such as attention or memory problems), but this is still the exception.

A speech pathologist may recommend additional evaluations for communication problems. If the client's communication problems appear due primarily to a hearing problem, evaluation by an audiologist will be recommended. Referral to an otolaryngologist (ear, nose, and throat physician) will be recommended if communication deficits appear related to medical problems or may have a surgical solution. A reading specialist may be asked to address specific problems that the client has with reading.

BEHAVIORAL PROBLEMS

As described in Chapter 4, evaluation by a neuropsychologist will provide

a comprehensive evaluation of behavioral problems and associated cognitive disabilities. The neuropsychologist may recommend additional evaluation by a neurologist or behavioral neurologist if behavioral problems appear related to medication or an acute medical condition. Referrals to a psychiatrist, clinical psychologist, or chemical dependency counselor may also be appropriate.

Psychiatrist

A psychiatrist is a physician with specialty training in evaluating and treating emotional and behavioral problems. While psychiatrists typically have training in psychotherapy, they are uniquely qualified in the use of medications and other medical treatments for emotional and behavioral problems. Clients with severe depression or very unusual thought processes, like hallucinations or delusions, often can be helped by the types of medical treatments that psychiatrists provide.

Clinical Psychologist

A clinical psychologist has training in evaluating and treating emotional and behavioral problems without the use of medications through psychotherapy or behavioral interventions. Clinical psychologists have particular expertise in setting up behavioral programs to address problem behaviors through the management of behavioral cues and consequences. Such behavioral management techniques may be taught to the client directly or to people close to the client who will assist the client in better managing behavior. If problem behaviors appear related to issues within the client's marriage or family, a clinical psychologist will conduct evaluations with other family members and may choose to implement behavioral and psychotherapeutic interventions in the context of marriage or family therapy.

Chemical Dependency Counselor

A chemical dependency counselor provides evaluation of drug and/or alcohol use and abuse patterns and the need for specialized treatment of these problems. Since abuse of chemicals (drugs or alcohol) is a leading contributor to traumatic brain injury (i.e., leads to high risk or reckless behaviors which potentiate accidents), a chemical dependency evaluation and treatment may be indicated.

As in the case of every other type of professional, it is important that psychologists, psychiatrists, and counselors to whom persons with brain injury are referred have knowledge and experience with the particular needs of persons with brain injury. If these mental health professionals are not aware of the particular problems and needs of clients with brain injury, they may recommend inappropriate treatment.

SAFETY

The evaluation of safety involves assessing behaviors in the home as well as on the job. To a certain extent, evaluation of safety involves testing of memory and problem solving. These abilities are evaluated as part of a typical neuropsychological evaluation. Thus, it can be expected that the neuropsychologist can offer some opinions regarding the client's safety in a variety of situations.

Knowledge of safe practices can be tested as part of an evaluation by an occupational therapist. This may consist of questions and answers regarding solutions to a variety of safety problems and hazardous situations. Taken further, the occupational therapist may also conduct evaluations of safety in simulated or actual settings. For example, a kitchen evaluation may take place in a model kitchen in a rehabilitation facility. The client may also be directly observed in the performance of household tasks in his or her own home by an occupational therapist.

Safety in the workplace may be directly observed as well, as part of a vocational evaluation. In these circumstances, the vocational evaluator can be specifically requested to observe safety practices.

INDEPENDENT LIVING AND ACTIVITIES OF DAILY LIVING

The areas of independent living and activities of daily living (ADL's) are related to safety, but go beyond it. Evaluation of ADL's refers to activities ranging from personal hygiene skills, to housekeeping, homemaking, cooking skills, to management of personal finances and budget. A comprehensive neuropsychological evaluation will allow the neuropsychologist to offer some comments in regard to expected levels and ranges of performance in these areas. Beyond this, an occupational therapist can offer direct observations and assessment in these activities. This may occur in an inpatient or outpatient rehabilitation setting.

In addition to such general evaluations, more specific, but less commonly available, assessments may be obtained through some facilities or programs which provide supervised trials of independent living (such as Independent Living Centers) over a several day period. Such programs are staffed by individuals with specialized experience in observation of independent living skills, and may include a treatment component as well.

PHYSICAL CAPACITIES

A client's physical capacity can be evaluated in standard evaluations conducted by physical therapists and occupational therapists. These will

frequently be available in facilities with inpatient and/or outpatient rehabilitation programs. In addition to these assessments, specialized evaluations of work functioning can be obtained. These may be identified as functional capacities assessments, offered most frequently by physical therapists, primarily in outpatient settings. These assessments provide detailed information in such areas as strength, range of motion, coordination, and endurance related to a wide variety of functional tasks with a vocational orientation.

Work hardening programs may also offer specialized evaluations of work-related physical capacities, along with specific physical limitations. These programs typically include a treatment component to improve functioning in such areas as strength, coordination, endurance, and body mechanics. Most typically, such programs are offered in an organized rehabilitation setting as an outpatient program. Usually, services are provided by occupational therapists and physical therapists under a physician's supervision. In general, these evaluations and treatments for physical capacities will not include evaluation or treatment of behavioral problems or work adjustment skills.

Adaptive equipment is often available to compensate for many impairments of functioning, such as sight, hearing, speech, mobility, and hand functioning. The need for standard adaptive equipment can be determined by routine physical therapy and occupational therapy evaluations. Special needs of particular individuals may require evaluation by a rehabilitation engineer. This professional may design and construct customized equipment to meet such special needs.

MOBILITY

Mobility refers to at least two distinct areas. First, mobility refers to an individual's basic capacity for locomotion. Secondly, mobility can also refer to an individual's ability to navigate successfully within the community. These two aspects of mobility are related, but separate.

Evaluation of basic physical mobility will usually be provided by a physical therapist. Some occupational therapists also provide assessment in this domain. Evaluations of these capacities usually take place in an inpatient or outpatient rehabilitation setting. Important issues include evaluation of the need for appropriate specialized equipment for mobility. In some cases, a rehabilitation engineer may also be involved in the selection and design of specialized mobility equipment and aids. Mobility equipment includes selection and/or modification of specialized wheelchairs or ambulation aids.

Assessment of mobility in the community setting includes evaluation of both physical and cognitive functioning. Neuropsychological evaluation will offer evaluation of problems with attention, spatial relationships, or judgments that may interfere with the client's mobility. Occupational therapy and physical

therapy evaluations can offer additional evaluation of the perceptual and physical capacities required for mobility. For individuals who are unable to drive, mobility issues will center upon ambulation or wheelchair travel, and the use of public transportation. Specific training in community mobility, including the use of available public transportation, may be offered by occupational therapists, Independent Living Centers, or rehabilitation facility staff members. In some locales, specialized community mobility trainers are available. Often the training is very specific to a metropolitan area and includes only the ability to read and use bus route maps and bus schedules. In other cases the training is even more specific and individual is only trained to travel from one specific location to another, for example, from home to the work site and return. The needs and abilities of the particular individual clients will determine an appropriate course of mobility training.

Driving

Evaluation for driving will require input from several sources. Some states and some insurance companies require authorization by a physician that the person has no visual or other medical problems that will interfere with driving. If the client has had a seizure, state laws usually require a physician's certification that the client has been free from seizures for a specified period of time (usually six months to a year) before returning to driving. As above, neuropsychology, occupational therapy and physical therapy evaluations are important in determining potential for driving. A few rehabilitation centers offer a specialized evaluation for driving using a driving simulator. A referral to a physiatrist who works at a rehabilitation center will result in a coordinated assessment of medical, perceptual, neuropsychological, and physical capacities relevant for a return to driving.

In the final analysis, the best test of a client's capacity to drive is a behind-the-wheel driving test. If such a test cannot be coordinated through a local rehabilitation center, a driving instructor can usually be found who is willing to conduct such an evaluation. Because attentional deficits may not reveal themselves in a brief period of time, the driving instructor should be coached to conduct an extended behind-the-wheel assessment of the individual of at least an hour in duration under varying driving conditions.

SUMMARY

The comprehensive evaluation of the client with a traumatic brain injury in the postacute rehabilitation phase will require a team of diverse specialists. It often becomes the role of the rehabilitation counselor to assemble and coordinate this team. This same network of specialists will be of great value in planning and providing comprehensive rehabilitation services.

Chapter 6

VOCATIONAL EVALUATION OF PERSONS WITH TRAUMATIC BRAIN INJURY

Dale F. Thomas, Ph.D., CRC

Dale F. Thomas, Ph.D., is an Associate Research Scientist with the Research and Training Center at the University of Wisconsin-Stout. He holds a Master's degree in vocational rehabilitation with a specialty in vocational evaluation. Dr. Thomas received a Ph.D. in educational psychology from Marquette University where his chief concentration was in diagnosis and rehabilitation of people with brain trauma injuries. Additional coursework and supervised practice in adult neuropsychology was completed at the Medical College of Wisconsin. Dr. Thomas established the first outpatient vocational rehabilitation unit for persons with brain trauma injuries in the state of Wisconsin in 1977 and has since been involved in numerous research and service projects in this area.

Presently, Dr. Thomas is the principal investigator for the traumatic brain injury research strand at the RTC and Project Director for the Head Injury Re-entry Program known as Project HIRe. In addition to the research duties at the RTC, Dr. Thomas is a staff psychologist for the Department of Neuro-psychiatry as well as the Behavioral Medicine Clinic of Luther Hospital in Eau Claire, Wisconsin.

The vocational evaluation of persons with a TBI should follow a logical sequence of activities which will accommodate the special needs associated with this disability as discussed in previous chapters. The intent of this chapter is to provide the experienced vocational evaluator with suggestions for conducting an evaluation of persons with a TBI, but is not intended to represent a "how to do it" approach that will train a reader in the art and science of vocational evaluation.

In many respects, the evaluator will carry out the evaluation in much the same way as with other "special populations," structuring work tasks on the basis of determining vocational assets, limitations, work needs, aptitudes, and general worker characteristics. The vocational evaluator must first develop a thorough understanding of the mechanisms of brain injury and the impact of these injuries on day to day functioning. Second, time must be taken to gather and review all records and reports of past evaluations and treatment. Understanding of the person's background, treatment history, and course of treatment will greatly aid in the interpretation of the results obtained from the vocational evaluation. Finally, the evaluator must strive to develop a strong linkage with the family and significant others and include them in the process as decision makers.

It is suggested that the vocational evaluation be structured to incorporate six elements in the vocational evaluation process as discussed in this chapter. These elements include: a) accumulation and review of background information in preparation for the intake interview, b) formulation of specific referral questions in cooperation with the referring agent, c) development of hypotheses that can be tested or addressed during the evaluation, d) initiation of the evaluation by starting in a controlled situation, e) vocational testing and situational assessment, and f) documentation of the entire process in the vocational evaluation report.

Incidence of TBI Referrals to Vocational Evaluation

Few studies have been published which report the number or percent of persons with a TBI served in vocational evaluation programs. Thomas, Czerlinsky, and Smigielski (1990), in a report of a study involving over 700 persons with a TBI, found that 73 percent of the respondents in need of vocational evaluation services received this service. A total of 68 percent of the persons who needed neuropsychological evaluations received them. Wagner (1988), in a survey of rehabilitation facilities serving persons with TBI in two midwestern states, found that of 111 facilities surveyed, the average number of persons with TBI served was approximately five per year. A total of 99 percent of all of the TBI referrals (n=89) received a vocational evaluation, but only 59 percent had received a neuropsychological evaluation. Nearly half of the respondents felt that a lower staff to client ratio was needed when serving a TBI population. The majority felt that they could work with a few such referrals per year without reducing the total number of persons served, but as the percent of

TBI referrals increased, more specialized services would be required.

These studies indicate that the typical vocational evaluator will see the majority of all TBI referrals before they enter a vocational rehabilitation program, but frequently they will not have access to a neuropsychological evaluation. Since both studies cited were conducted in midwestern states this may not be representative of other parts of the nation. Except in large urban areas, or in the case of facilities dealing strictly with a head injury caseload, the majority of the vocational evaluators working with TBI referrals may expect less than 10 percent of their caseload to be represented by this population. This chapter will speak to the typical evaluator who serves head trauma clients as a relatively small portion of their entire caseload.

ACCUMULATION AND REVIEW OF REFERRAL INFORMATION FOR THE INTAKE INTERVIEW

The review of referral information in preparation for the evaluation intake interview is a critical first step in beginning to develop a strategy for vocational evaluation planning. Persons with traumatic brain injury have often been through extensive medical and therapeutic treatment programs. Consequently, there is often a large amount of background information available regarding the extent of the injury, response to treatment, and residual deficits. Reviewing and developing an understanding of this information can be a necessary but time consuming process. Sufficient time to complete this task must, therefore, be arranged. For the vocational evaluator who is serving persons with a wide variety of disabilities, the process of tracking down and reviewing this information will be an important scheduling consideration. Despite the extra up front time and effort, a thorough review of diagnostic and background information will provide a solid understanding of the person's cognitive, physical, and social adaptive functioning.

Following head injury it is common for people to expect that they will return to their pre-injury level of performance as their physical and mental functioning improves. Therefore, it is important to understand the person not only in light of current abilities and limitations but also to understand the client's pre-injury abilities and sense of self. Information which describes pre-injury functioning levels, course of medical treatment, and rehabilitation completed will provide a broad picture of progress to date.

Hospital and treatment discharge summaries will often describe not only what rehabilitation has taken place, but may also offer suggestions for vocational planning and future treatment possibilities. For example, speech therapy may have been discontinued due to funding problems or because an oral appliance was requested before therapy could be continued. The answer to a question which the evaluator may raise such as whether or not speech therapy could improve expressive language, may be answered in part by reviewing a speech

pathologist's discharge report, if one is available.

When it is feasible to do so, the evaluator should strive to obtain all relevant background information prior to the start of the evaluation. Cognitive, physical, and psychosocial problems associated with a physical disability may potentially cause work problems. However, these problems may not be easily identified by others, and as such, may be mislabeled as a behavioral or other type of problem. Obtaining all background information and developing a thorough understanding of this information is so important to good planning that it may be considered the "golden rule" of case planning with TBI referrals. The client who continues to perform an assembly task in a certain manner, after repeatedly being told to employ a different sequence of steps, may be stubborn or have a behavioral problem. More likely than not, however, problems with memory or sequencing are contributing to or are solely responsible for the problem behaviors. Knowledge of such problems are essential to explaining potential work problems and preventing work problems before they start.

The evaluator should attempt to use background information to profile what is known about acquired deficits and preserved skills and then use this knowledge to structure assessment tasks. Consideration should be given to how identified deficits could create work problems and how remaining assets may be used to compensate for or offset negative factors. In the case of an assembly worker with memory problems, the evaluator should pay attention to material layout, the use of jigs or fixtures, and an instructional approach that fits best with the person's learning style.

SOURCES OF REFERRAL INFORMATION

Medical Information

Details of physical problems and limitations should be available in the general medical evaluation report. A physiatrist (a physician specializing in physical medicine) may provide the best information regarding current physical status. Family members often know about additional physical restrictions or precautions. In instances where the evaluator has the opportunity to meet a referral before an employment physical has been completed, questions regarding the impact of physical impairments can be posed to the physician. This will allow the evaluator to obtain medical opinions regarding work tolerance, work schedules, or special precautions.

Appendix C includes an example of a physician questionnaire which can be used to profile medical related issues commonly encountered following a TBI. Family members and the client may have suggestions or questions to address to the physician as well. After the physician completes this form and has addressed medically related concerns, the evaluator is responsible for determining if the identified problems or functional limitations are likely to

interfere with job performance in reference to specified job goals.

Medical conditions often improve rapidly during the early months following an injury. This is particularly true for individuals who were recently disabled by a TBI and require frequent contacts with medical personnel. A full vocational evaluation may not be warranted for such persons, if it is less than one year postinjury and the person experienced a significant head injury. Often a brief assessment of current skills, as a baseline measure, is reasonable. If significant improvements in physical condition is likely, additional re-evaluation at periodic points may be needed. The evaluator who is unable to be flexible in time scheduling and who must stick to a rigid schedule of evaluation due to contractual arrangements will certainly be at a disadvantage in this regard.

Using Neuropsychological Evaluation Results

Of all the sources of information available to the evaluator, the results of a neuropsychological evaluation, should be of considerable value in planning the evaluation. Information on cognitive and sensory-motor skills, learning characteristics, attention and memory, and personality characteristics are typically discussed in a neuropsychological report. These factors should lay the ground work for what will be explored in the evaluation.

Most neuropsychological reports contain technical information which is difficult to understand. It therefore is important to develop a working relationship with a neuropsychologist so that a consultation can be arranged if necessary. If possible, it is recommended that a neuropsychologist be retained as a consultant for interpreting technical reports, designing behavior management programs, and assisting in treatment program development. A rehabilitation or clinical psychologist, who has the experience and ability to clearly relate neuropsychological functioning to work related matters, may serve as an alternative consultant, if he or she exhibits a thorough knowledge of brain-behavior relationships (Corthell & Tooman, 1985).

In some cases, however, a psychologist who has not had specific training in head injury rehabilitation or neuropsychology may do more harm than good. For example, a psychologist may see a brain injured person and administer an intelligence test, a Bender-Gestalt Test, and a clinical interview. On the basis of this information, they may render an opinion that the person is "free from organic impairment." A lay person reading the report, usually will regard the psychologist as an authority on the subject and accept this opinion. The evaluator should not be surprised if a psychologist without proper neuropsychological training refutes the presence of neuropsychological dysfunction despite the evidence of reports to the contrary, especially if the TBI was not severe.

In rural areas, evaluators may find themselves unable to obtain a

neuropsychological evaluation. When this is the case, the evaluator will necessarily assume a greater responsibility for interpreting the reports of other specialists such as occupational therapists, physical therapists, and language therapists to begin to fill in the gaps of what is known about the person's abilities. When the evaluator must patch together information from a variety of sources, it becomes even more important to obtain a comprehensive working knowledge of brain behavior relationships. The report of a neurologist or psychiatrist should not replace a neuropsychological report, since the manner in which these disciplines approach an examination are not comparable.

One format which may be useful to the evaluator is the Neuropsychological Profiling Form (Thomas, 1990), which can be used during the vocational evaluation. The Neuropsychological Profile Form (see Appendix C), provides a listing of common variables important for the evaluator to consider. As with the Medical Profiling Form, this list is intended not as a replacement or shortcut to a comprehensive neuropsychological evaluation report, but as an aid to the evaluator in identifying potential limitations or problem areas. Again, it is the evaluator's responsibility to determine if the indicated problems will present problems in light of identified job goals. As the job goals change, the relative impact of the problem on job functioning may vary, again stressing the importance of evaluating the TBI referral in light of a specific job goal whenever possible. As the job goal is changed, the neuropsychological rating may not change, but the likelihood that a particular problem area will cause work problems is likely to vary.

Achievement Test Results

The majority of all persons who sustain a TBI are young adults. Therefore, it is likely that they have had recent contact with school psychologists or guidance counselors for academic testing. School personnel may also provide a contrast between pre-injury skills and post-injury skills, especially if education was completed since the injury. The level of post-injury educational and remedial support needed in order to complete coursework is important to consider. Some persons may have intentions of attending college, and may possess above average intelligence and academic skills, however memory problems and poor reasoning ability could necessitate extensive remedial work. Information of this nature may only be available through informal means such as telephone consults with former teachers.

Information about training obtained prior to and since the injury can also provide insights into both present and former abilities. A man who was trained as a skilled craftsman, for example, may maintain an interest in hands-on occupations. Family, friends, or co-workers may provide additional information regarding special traits or abilities which may be important when advising on future training potential. Pre-accident worker characteristics can serve as indicators of future functioning levels. The person who was a marginal worker

or who had a poor work history before the accident will likely demonstrate less potential than one who was a steady and reliable employee to whom an employer may be willing to offer special re-training and accommodations (Thomas, 1989). Information regarding former work habits, special skills, interests, and technical abilities may provide clues for future vocational involvement. Former co-workers can be an excellent source of information about vocational skills.

ARRANGING AND CONDUCTING THE INTAKE INTERVIEW

When the evaluator is initially contacted by a referral source to arrange a time for an intake interview, an attempt should be made to obtain a behavioral description of the client. Special considerations that may affect the interview scheduling should also be noted. For example, a person may be less fatigued and more responsive in the morning, or may need assistance when transferring from a vehicle. Furthermore, the person may respond better in the presence of one interviewer because of distractibility. Such information is helpful to the evaluator in pre-assessment planning. Beginning the interview in a positive manner is critical to the evaluation, and possibly to subsequent services, since other services are often contingent on evaluation outcome (Thomas & Menz, in press).

Obtaining a Working Commitment

It is especially important for the evaluator to obtain a commitment from the client to voluntarily participate in the evaluation. This should be obtained at the onset of the interview. By informing the person that participation in the evaluation is open only to those who agree to participate, and that they cannot be forced to attend the program, can serve to reduce conflicts regarding their perception of the importance of involvement in a program (Thomas, 1987). This action can initiate a powerful motivation mechanism that is intended to give the person a sense of control (Weiner, 1982). If it is apparent that such a statement cannot be obtained, the evaluation may be initiated in spite of this, with the realization that the evaluator may accept a larger responsibility for attempting to coax the person through parts or all of the program.

If the person refuses to participate in the evaluation, a compromise may be reached by asking them to complete three or four days of the program before making a decision to drop out. Reluctance to participate in evaluation activities is not uncommon. Such reluctance must be handled through a directive approach and should not be viewed as a refusal to participate. In some cases, when the person refuses to participate, the evaluator may inform the person that they will be scheduled for two days of evaluation after which time their continuation in the program will be negotiated.

Often, the thought of trying something new is frightening, but after some success during the first few days, attitudes may change. Each case should be

viewed individually, using the judgement of the rehabilitation team to determine the level of commitment necessary in order to continue the evaluation. The evaluator should, however, avoid the position of pleading with a person to remain in a program. Supportive statements such as "I would like you to finish the day (or two more days, or a week, depending on the situation) before you decide to quit, although that decision, is up to you," demonstrates support for the person but demands that they make a commitment to the rehabilitation program in order to continue.

Legal Issues

It is not uncommon for persons who have sustained a recent TBI to be involved in lawsuits or hearings regarding settlements or award of social security benefits. Although it is often best to defer vocational rehabilitation efforts until settlements are finalized, this luxury will not likely be the case with all referrals. In order to document information for legal purposes, the evaluator should carefully document all contacts with clients in evaluation and keep observational data neatly organized and objectively reported, especially if the evaluation is being done with the idea of using the evaluation results in legal proceedings. When vocational evaluation reports are intended for legal use, the evaluator may wish to be prepared to use the data from the evaluation to describe the person's vocational limitations in relation to their former job, as well as to estimate how these limitations will limit future upward mobility. Vocational limitations in light of the person's current targeted job goals should also be considered.

Formulation of Referral Questions

The process of identifying referral questions can help give direction to the evaluation. In some cases it will be evident from review of background information and a preliminary assessment that a person experiencing mild to moderate work related limitations may return to previous employment or a related job with transitional support. If the immediate goal is to place the person on a particular job, the process of evaluation will be more streamlined and in fact will be more prescriptive (Thomas, 1989).

As an illustration, consider two hypothetical referral questions which an evaluator may receive when receiving the referral of a person who sustained a moderate head injury from an auto accident which occurred one year ago. In the first example, the referring agent asks the standard question: "Is Ms. White employable and if so, identify jobs for which she is best suited in terms of interest and potential." As a second example, consider the following referral question: "What is the likelihood that Mr. Brown can return to his previous job as a diesel mechanic at ABC Transport. Also, please comment on job modifications which may be considered or other related jobs that this man may be capable of performing considering his 20 years of mechanical experience, if return to the previous job is not recommended." As both examples are

considered, one can begin to picture how differently an evaluation would have to be tailored to address each of these two referral questions.

Developing Assessment Hypotheses and an Evaluation Plan

As the evaluator begins to understand the assets and limitations of the person, evaluation tasks can be arranged to test hypotheses that the evaluator is beginning to develop. A hypothesis testing approach will help to structure the steps in an evaluation (Lezak, 1985). For example, the evaluator who realizes that a person has problems with verbal memory but has relative strengths in visual memory and procedural memory may design a series of tasks to explore how the person best learns directions for work assignments. In this particular case, the evaluator may assign similar work tasks, one in which the person received verbal instructions only, and another using a hands on approach with visual cues and repeated learning trials.

McCray and Blakemore (1985) found that when persons demonstrate variable learning styles, the use of five or more learning trials can be a good predictor in learning style analysis. By selecting the best 20 percent of all work trials as a predictor in analyzing learning curves for persons under various learning situations, the evaluator can obtain an estimate of the effects of repeated task performance on productivity. This approach appears to hold merit for the evaluation of persons with a TBI who demonstrates significant variability over consecutive observations (see McCray & Blakemore, 1985 for detail of approaches to analysis of learning styles).

The evaluator should consider the positive aspects of a person's work skills, personality, and background in light of functional limitations which may create work related problems when planning the evaluation. An important factor in evaluation planning is consideration of the severity of functional impairment (mild, moderate, or severe) in terms of potential work functioning. Understanding the severity of limitations in a vocational sense can help to develop an appreciation for the potential differences in functioning between various referrals. Classification of referrals by range of vocational impairment is a fairly common practice and is useful in understanding work problems. However, it is common for persons who are unfamiliar with the broad range of difficulties which may potentially exist, to view all persons with head injuries under one broad category regardless of severity (Thomas, 1987).

When considering the severity of vocational limitations, one must consider the vocational goal. For example, a man who was a bookkeeper and sustained a head injury which resulted in memory problems, concentration difficulties and inattention may now be severely vocational disabled if returning to bookkeeping. If, on the other hand, the person is considering working as an interior house painter, which was his occupation before bookkeeping, the vocational limitation may be mild. The following categories can be used to conceptualize the severity

of vocational limitations:

> No limitations apparent. The person can perform the job without assistance, at a competitive rate and quality and demonstrates potential to be flexible in work assignments.
>
> Mild vocational limitations. Few or no limitations. Job performance is generally adequate, however changes in work assignments are likely to cause problems. Problems in work speed or quality may be noted. Selective placement may be required.
>
> Moderate vocational limitations. Vocational limitations are such that the person is likely to be successful only under prescribed circumstances of work environment, supervision, and/or hour restrictions. Quality or quantity of work is likely to be below industry standards. Job placement will require supported or transitional employment for initial instruction and an extended follow-up period.
>
> Severe vocational limitations. Long-term supported employment will likely be necessary. Due to productivity or quality of work, a special wage certificate may be needed or a person to assist at the workplace may be necessary. Intensive job support and intervention will be required, or sheltered employment will likely be necessary.
>
> Profound vocational limitations. Work, either sheltered or supported, is unlikely in the foreseeable future.

With this framework in mind, consider for example, a person who sustained a moderate closed head injury from an assault, which resulted in right-sided motor weakness, motor slowing, and dexterity problems with other cognitive factors being generally described as adequate. Assume also that the person demonstrates adequate attention, concentration, and visual perceptual skills along with a strong work ethic and a strong supportive family. Considering these factors, vocational limitations associated with work as a visual inspector perhaps may be mild, although motor speed may limit productivity. If this person was being considered for placement as a small parts assembler in a competitive work situation, vocational limitations may be in the moderate to severe range. Although any such opinions need to be fully evaluated through work samples, job samples, or job trials, this hypothesis testing approach can help the evaluator to tailor a prescriptive vocational evaluation.

Initiating the Evaluation

Vocational evaluation of the TBI referral can be simplified by defining the type of evaluation that would be most appropriate to the individual on the basis of the referral questions. A general rule of thumb is to begin by starting in a

controlled environment such as a vocational evaluation unit and conclude by conducting situational assessments first in controlled situations and if feasible on community-based sites. By starting in the vocational evaluation unit, the evaluator will have the opportunity to observe behaviors and begin to develop a strategy for continuing the evaluation.

Evaluation tasks should begin with assessment of areas where persons who have experienced a TBI are likely to exhibit difficulties. Thomas, Czerlinsky, and Smigielski (1990) found a number of areas which represented problems to the majority of subjects studied in a recent survey of vocational, social, and personal needs. These areas, which are essential to examine in a vocational evaluation, are listed below along with the percentage of people in their study who experienced problems in each respective area.

1. Physical related problems:

Balance	74%
Lifting	70%
Walking	70%
Strength	52%

2. Sensory and motor problems:

Coordination	72%
Vision	48%
Pain Perception	23%
Hearing	17%

3. Cognitive problems:

Memory	74%
Organization and Planning Ability	62%
Communication	57%
Attention	54%
Writing	51%
Reading	49%
Visual-spatial Skills	45%

4. Social and behavioral problems:

Irritability	48%
Social Judgement	45%
Maturity	43%
Social Awkwardness	40%
Impulsiveness	40%
Isolation	33%
Aggressiveness	25%

5. Emotional related problems:

Anger	69%
Depression	67%
Anxiety	64%
Behavioral Problems	40%
Suspiciousness	29%

6. Activities of daily living:

Self Care Skills	54%
Safety	48%
Money Handling	31%

Most of these factors are important to address before a community-based assessment is attempted. The manner of assessing each respective area will vary with the type of assessment that is conducted, but will likely be evaluated in one of four ways. These ways include getting the information about functioning in each area from (a) a reliable source, (b) through review of previous records or reports, (c) through evaluation examination or testing, or (d) direct observation.

As a means of getting started with the vocational evaluation, begin by assessing dexterities, assembly skills, and fine motor tasks as one may proceed with most any referral. Basic academic testing and vocational interest testing are also good measures to consider in the early part of the evaluation. If work samples are used, one may wish to examine range of motion, reflexes, gross and fine motor abilities and stamina. As the assessment progresses, problem-solving skills especially those which occur in social and unstructured situations should be evaluated. Other attributes such as mental flexibility and ability to transfer learning from one situation to the next, should also be assessed. Working memory and ability to problem solve on the job should be documented as well. Emotional related issues can be evaluated in a general sense from information obtained during counseling sessions and from direct observation and conversations with family, supervisors, and others during the evaluation.

Evaluation tasks should be arranged to promote success in the first few days, yet be challenging enough to hold the person's interest. The evaluator should be prepared to explain how the tasks that they are giving the person relate to assessment of work potential, since this is something that is frequently challenged. If necessary, part time involvement should be considered, especially if one is scheduling a brief baseline type of assessment. If the evaluator wants to test the person's tolerance for an eight hour work day, this should be explained to the referral and the family, and several full eight hour days should be scheduled. Due to the fact that evaluations are typically set up for a six or seven hour period per day, this may necessitate special arrangements. Since lack of endurance and stamina is a common problem following a TBI, the evaluation schedule is of primary consideration.

At the very least, an assessment of independent living skills can be done by conducting an information gathering interview with reliable family members or significant others. People with head injuries may not accurately report how well they can manage independent functioning, therefore other sources should always be consulted to verify their self appraisal. Thomas, Czerlinsky, and Smigielski (1990) suggest a number of activities of daily living which should be evaluated with all TBI clients referred to vocational rehabilitation programs. There is a sufficiently high incidence of problems in these areas of daily functioning that evaluation in these areas is recommended. Table 1 lists the activities which were most troublesome to the subjects studied.

If possible, an evaluation of other independent living skills should be arranged. Many vocational rehabilitation facilities offer this type of assessment, or can arrange for this type of assessment through a regional Independent Living Center. When assessing independent living skills, look for discrepancies between home care skills and work behaviors and report these differences in the evaluation report. For example, a person may appear to be very dependent and in need of high structure and supervision in the workplace, but may in fact be independent in house chores, budgeting, and minor home maintenance.

Table 1
RESPONDENTS REQUIRING ASSISTANCE WITH ACTIVITIES OF DAILY LIVING

Activity	N	% Requiring Assistance
Manages own finances	556	68.3
Obtains medical help if needed	575	58.3
Shops for groceries	513	54.6
Drives a car	387	53.2
Prepares own meals	546	53.5
Uses public transportation	388	52.6
Cleans the house	517	47.6
Takes care of minor injuries	570	47.7
Grooming	678	41.6
Selects clothing	673	39.1
Bathes self	682	38.3
Washes dishes	535	37.9
Dresses self	681	34.8
Uses telephone	612	33.3
Crosses the street	584	32.7
Finds way in neighborhood	574	30.8
Makes change for $5.00	595	29.7

Assessment of Psychosocial Skills

Social functioning is an essential area to consider when assessing vocational adaptability, since social skills are a powerful factor influencing a person's successful return to work (Thomas, 1986). Information regarding social appropriateness, as well as other important information such as income needs and family support, can be obtained from family members or significant others. Gathering such information will be time consuming but can be critical to vocational planning. Social functioning in the work place may differ from what the family reports, therefore an attempt must be made to obtain this information from work supervisors or other independent observers. Behavior checklists such as the Vocational Adaptivity Scale (Thomas, 1983, revised 1988), the Functional Assessment Inventory (Crewe & Athelstan, 1984), and the Work Personality Profile (Bolton & Roessler, 1987) can be useful for tracking such data. Figure 1 provides a sample of the types of items included in the aforementioned rating scales.

Understanding why a person may behave in the way that they do is as important to the rehabilitation planning process as is the knowledge of the types of psychosocial problems that exist. Therefore, attention must be paid to

possible reasons for undesirable behaviors. For example, a person may appear to be irritable and argumentative. Irritability and argumentative behaviors may have been a pre-injury personality characteristic thus may be difficult to change. However, the person may be depressed and/or agitated and the behavior may be a symptom of another problem. If the psychosocial problems appear to be rooted in a psychological type of difficulty, a neuropsychologist may provide information regarding whether or not a referral for psychological or psychiatric intervention is necessary.

VOCATIONAL ADAPTIVITY SCALE

IV. SOCIAL ADAPTIVE BEHAVIORS	(X) Not Observed	Circle One
60. Displays an appropriate awareness of surroundings and and activities in the immediate vicinity	____	1 2 3 4 5
61. Expresses self clearly and efficiently	____	1 2 3 4 5
62. Demonstrates courtesy to other workers	____	1 2 3 4 5
63. Maintains proper posture and distance from others during conversations	____	1 2 3 4 5
64. Demonstrates appropriate volume of voice	____	1 2 3 4 5
65. Displays acceptable expression of emotion	____	1 2 3 4 5

FUNCTIONAL ASSESSMENT INVENTORY

23 REQUIREMENTS FOR SPECIAL WORKING CONDITIONS
- 0 No significant impairment.
- 1 Placement options are limited to some degree by disability requirements. (e.g., may need freedom to sit, stand, and move around as needed, or may need to avoid exposure to dangerous equipment.)
- 2 Multiple environmental restrictions related to the disability substantially limit placement alternatives.
- 3 Capable of functioning only in highly selected settings. Special placement efforts essential.

24 WORK HABITS
- 0 No significant impairment.
- 1 Is deficient in work habits (e.g., punctuality, ability to persist at work tasks with minimal supervision, or appropriate interview behavior). However, is willing and able to learn these skills quite readily.
- 2 Work habit deficiencies may require that work adjustment training precede employment.
- 3 Has severe deficiencies in work habits and seems to have little potential for improving through work adjustment training.

25 SOCIAL SUPPORT SYSTEM (See Instructions.)
- 0 No significant impairment.
- 1 Little or no support system available.
- 2 Support system at times encourages values or behaviors that are contrary to rehabilitation goals.
- 3 Support system is clearly working against rehabilitation behaviors.

WORK PERSONALITY PROFILE

● ① ② ③ ④	1. Sufficiently alert and aware
● ① ② ③ ④	2. Learns new assignments quickly
● ① ② ③ ④	3. Works steadily during entire work period.
④ ① ● ③ ④	4. Accepts changes in work assignments
④ ● ② ③ ④	5. Needs virtually no direct supervision
④ ① ● ③ ④	6. Requests help in an appropriate fashion
● ① ② ③ ④	7. Approaches supervisory personnel with confidence
● ① ② ③ ④	8. Is appropriately friendly with supervisor

Figure 1. SAMPLE ITEMS FROM VARIOUS BEHAVIOR CHECKLISTS

ASSESSMENT OF BACK TO WORK POTENTIAL

One method for assessing whether a head injured person can return to a former position, line of work, or a related job is to examine the person's ability to perform specific duties of the job in question. This is a commonly used evaluation technique (Pruitt, 1986) which is essential to consider when evaluating a person with a TBI. Using this approach, the job which the person is expected to enter or re-enter is studied and a job analysis is performed (U.S. Department of Labor, 1972).

The analysis should examine all skills, traits, and temperaments important to functioning on the identified job. Tasks that the client can not adequately perform must be identified so the evaluator can determine if job restructuring or modification could facilitate a return to work (Thomas, 1989). In addition to conducting a job analysis, the evaluator must also study the surroundings in which the person may be involved in any particular job, and if possible for each specific job in which the person may be involved. This environmental analysis (Wehman, Kreutzer, Stannington, Wood, Sherron, Diambra, Fry, & Groch, 1988) may be of more importance than the job analysis and must not be overlooked. Some authors have suggested the use of a video tape recorder to film the job being analyzed. Where this at first seems to be an ideal way to study a job, it has been this writer's experience that this approach has limited utility. First, many companies, especially manufacturing firms, will not allow video taping on sight, and second, this process creates a high visibility that draws additional attention to the entire process and therefore the use of a video camera becomes a burdensome task.

After a job and environmental analysis is completed, work site modifications or rehabilitation engineering may be needed to design jigs or fixtures to compensate for known problems. Modifications to jobs may also be done to minimize environmental difficulties. For example, the elimination or modification of a specific element of the job such as retrieval of supplies from an elevated storage area if balance or dizziness is a problem, may be required.

A major difference between evaluating the person with a TBI and persons with other disabilities, using a return to work potential approach, lies in the fact that the TBI referral will likely exhibit more significant psychosocial and cognitive problems. While such difficulties may be easy to recognize, they are often difficult to document and relate to potential work problems. Because cognitive and psychosocial problems common to TBI survivors may or may not have an impact on adjustment to work, depending on targeted job goals, the importance of specifying the particular job for which a person is being evaluated becomes an important factor to consider (Thomas, 1987).

USE OF STANDARDIZED TESTS

Testing of academic skills is a routine procedure during the course of a vocational evaluation. If referral information describing recent testing is not available, the evaluator should proceed with an assessment of math and reading skills early in the assessment. It is desirable to also estimate levels of skill development that existed before the injury and present this information in contrast to current abilities as documentation of how the person has changed since the injury. If pre-injury test results are not available, the evaluator may describe how the person performed writing, correspondence, or math functions on the job, or may mention proficiency implied through coursework (e.g., math courses completed).

It is important to assess any disparity between pre and postinjury functioning, especially when a person is being evaluated for return to a former occupation or related job. Despite the fact that academic skills may imply adequate functioning on the basis of test results, other cognitive problems such as extreme distractibility or poor delayed memory recall may cause an inability to perform on the job and therefore an assessment of applied skills should also be included. For example, the person who worked as the editor of a company newsletter before a head injury may read and spell at a level as suggested by achievement testing, but may be unable to recognize errors in print due to distractibility, neglect problems, or a host of other reasons. Furthermore, ability to read and write may deteriorate rapidly as stress or distractions are introduced into the environment or as the person becomes fatigued. As this example implies, in addition to an examination of skills in math, reading, or writing, one must also pay special attention to the impact of other neuropsychological factors on the ability to use these academic abilities in the workplace. The assessment of academic skills should therefore not stop in the evaluation lab but should also be situationally assessed in the workplace. The assessment of applied abilities in the actual environment where the work will be performed is a more ecologically valid estimate of skills and is preferred over a simple paper and pencil test of these abilities in an evaluation laboratory.

Achievement Tests

When considering specific achievement tests to administer during the evaluation, the evaluator may wish to consult a neuropsychologist who has been previously involved with the case. In many cases, tests of reading or tests of sight vocabulary will be available. The neuropsychologist should be able to suggest if further diagnostics are suggested or if a practical assessment of math or reading is warranted. Depending on the individual needs of the case, one may wish to simply obtain a general estimate of academic skills followed by a work task which will allow the evaluator to determine functional skills that are work related. In other cases, a test which specifically assesses ability in prescribed areas may be the test of choice. In cases where the concern is the

remedial procedures necessary to improve reading attack skill or potential to improve reading and retention of written material, achievement tests that are more diagnostic should be considered.

VOCATIONAL TESTING

Although most referrals will have a variety of reports of neuropsychological, educational, and functional skills, few referrals are likely to have had vocational related tests. An examination of a variety of publications dealing with approaches to vocational rehabilitation of TBI referrals failed to find but a rare mention of the concept of using or not using vocational tests in the vocational evaluation of a person with a TBI. When administered and interpreted with caution, in light of neuropsychological deficits, tests which assess aptitudes, traits, and abilities of a vocational nature can enhance the evaluator's understanding of the person's work potential.

Interest Tests

The use of vocational interest inventories with a person who had a traumatic brain injury can provide valuable information about general as well as specific work interests and work related needs. Regardless of the severity of the injury, the majority of all referrals can participate in vocational interest testing in one form or another. Interest tests can be considered to fall under the category of a picture interest test, which requires no or very limited reading abilities, or can be considered to be a written test which the client must either read or have read to them.

When selecting interest tests, consider not only reading level but other factors such as distractibility, attention, and memory. If attention is a problem, provide a workplace with few distractions and break the testing into two or more segments if necessary. Consider the use of an audio tape recording as an aid for those with reading and/or attention problems. Verify that instructions are understood and check periodically to see that the person is continuing to respond to items as instructed. Persons with auditory difficulties or receptive language problems may not benefit from an audio tape and may in fact perform better with only a printed version of the test without a recording.

Another factor to consider when selecting interest tests are the difficulties that may be encountered if the person has visual/perceptual problems. If a person is noted to have visual/perceptual problems and is unable to complete written or audio taped interest tests, the evaluator may consider a picture interest test while paying close attention to the manner in which the person is attempting to complete the test. Frequent verification as to why particular responses are given can be used to determine if the person is accurately following directions and understanding the process. Circumstances affecting the reliability or validity of test results should be duly noted in the evaluation report. Any test which

purports to measure interest, aptitude, or reasoning abilities may be invalid or unreliable if a person is known to have visual/perceptual problems. A neuropsychologist should be able to comment on the usefulness of such tests with persons having such difficulties.

Occasionally head injured clients may find interest tests to be vague because of abstraction problems or they may see the process as unrelated to work. Thomas and McCray (1988) describe a method of using a newspaper as a means of assessing work interests. Using this method, clients are instructed to review the Sunday employment section of a metropolitan newspaper and to circle any jobs that sound remotely interesting. At a subsequent session the person is asked to review all jobs circled and to select the ones that they consider most appealing. Finally, the person is interviewed to determine what was found to be most interesting about each job. The evaluator can then investigate reasons why certain jobs were selected and provide a basis for further job exploration. Although the process may be too complex to use with some referrals, it may be used selectively as a means of assessing work interests.

Personality Tests

Personality tests are sometimes used by vocational evaluators as an extension of a work needs assessment. Tests such as those which assess vocationally oriented personality factors or personal and work needs are examples of personality tests frequently used by evaluators (Botterbusch, 1986). These and similar tests can provide information regarding personality traits which may be important to job and personal satisfaction. Again the evaluator must consider the person's reading ability and cognitive skills in determining with whom such tests will be used. Occasionally evaluators may have access to results of personality tests administered by psychologists such as the Minnesota Multiphasic Personality Inventory (MMPI or MMPI-2). Caution is urged when conclusions are drawn from results obtained by brain injured persons, unless the psychologist is experienced in working with TBI. Because of the manner in which brain injured people approach the test, some may appear to be more severely maladjusted than is actually the case (Alfano, Finlayson, Stearns, & Nellson, 1990).

An incomplete sentence test can often provide valuable information regarding current concerns and problems. An incomplete sentence blank can also be used to assess ability to express one's self in writing under a somewhat structured situation. Incomplete sentence blank tests will provide a stem of a sentence and require the examinee to finish the statement. Typical stems may include such material as (a) At work my supervisor ..., (b) During coffee breaks and lunch I like to ..., and (c) The best job is ...

If neuropsychological testing has been done, an assessment of personality functioning will likely be offered by the examiner. The vocational evaluator

should not use personality measures to identify personality disturbances or mental disorders as a psychologist would do. Rather, the evaluator's concern should be in matching personality characteristics, work needs and traits to jobs that will be compatible to that particular person.

Aptitude Testing

Aptitude testing is an area likely to produce some interesting and useful observations. There are many reasons why a test may underestimate aptitudes and abilities as discussed previously. When a person excels in a particular area, the evaluator will be provided with an incentive to further evaluate that person's skills by work samples or by observing them in protected work sites or community-based situational assessment. Results of aptitude tests, however, should be interpreted with caution. A person may have the aptitude for various types of occupations as measured by standardized tests, but may be hampered by a memory problem or inability to accommodate various rapid changes in work method or routine. On the other hand, a low score on an aptitude test may not necessarily indicate low aptitude, but may be a function of other cognitive problems such as inability to attend to critical elements in pictorial stimuli. On an actual job the person may be able to identify the problem because it may not involve as fine a discrimination. One mechanical comprehensive test, for instance, displays a 2" x 2" example which in real life would represent a 10" x 10" block and tackle display.

Aptitude tests commonly administered during vocational evaluation, such as composite test batteries which examine a wide variety of aptitudes or skills, will often provide useful information for vocational planning, especially tests which assess motor speed and accuracy. As with any aspect of the evaluation process, a solid knowledge of head injury rehabilitation and common sense must guide the evaluator in choosing testing tools that will provide the most accurate and valid results.

Work Sample and Job Sample Approaches

The use of work samples with TBI referrals has been a focus of controversy among writers in the field. The basis of this controversy is grounded in the fact that on one hand, the majority of all vocational evaluation services purchased by state vocational rehabilitation agencies across the nation have employed the use of work samples as a principal mode of operation (Thomas & Bordieri, 1987). On the other hand, it has been argued that any evaluation of persons with a traumatic brain injury should be done in the context of the job in which they will be placed (Corthell & Tooman, 1985). Because of difficulties in abstraction and generalization and the fact that the social and ecological demands of an actual job site are far removed from the evaluation laboratory, an incomplete picture of the person's functioning is likely to be seen. Keeping in mind some of the limitations inherent with a work sample approach, one can build a strong case

for the use of work samples within the vocational evaluation process with referrals who have experienced a TBI.

First, work samples can provide a standardized approach to assessing factors such as assembly skills, organization of materials, problem solving skills, and certain applied skills such as use of hand tools, measuring, weighing, filing, and other skills. Work samples can provide the evaluator with the opportunity to test hypotheses about work skills before attempting a situational assessment. Take for example the person who aspires to return to clerical work involving typing and filing. These skills could be assessed on an actual work site. The opportunity to practice these skills and to give the evaluator the first hand experience of modifying or simplifying job tasks or arranging the work site in an optimally efficient design can be achieved in the context of the evaluation unit using work samples or job samples.

In cases where safety awareness is a question, an assessment of ability to use hand tools and machine tools is best completed in a controlled situation before going to the machine or wood shop for a try out. At times the evaluator may find that the demands of the evaluation go beyond the level of their expertise and in such cases a specialist must be called upon. For example, the referral question might ask, "Can Mr. Jones return to his former job as a punch press operator?" The evaluator should assess safety awareness in the evaluation unit under a controlled situation before placing the person on an actual job sample using a punch press machine, especially if the evaluator had little knowledge of the use of such equipment. With this type of situation, a safety consultant familiar with this type of machinery may be retained to conduct an assessment if the evaluator is satisfied that there is a reasonable likelihood of success under a supervised situation. If problems exist, a rehabilitation engineer or rehabilitation technologist may need to be consulted as well.

When work samples or job samples are used, there should be a specified purpose, and they should resemble the type of work that the person is being evaluated for. Use of real work for which there is remuneration consistent with prevailing wage rates should be used whenever possible in addition to, or in place of, work samples as appropriate. If job samples are used, they should be used to determine ability to perform the job and to screen for potential problems, followed whenever possible by placement onto an actual job site. Using this approach may necessitate the development of a close working relationship with a job development or placement specialist and a job coach or work trainer.

SITUATIONAL ASSESSMENT

The trend in vocational evaluation for all disability groups, in recent years, is to use real jobs in integrated work settings (Wehman et al., 1989). When working with persons who have sustained a TBI, one must consider the aspect

of ecological validity. Since transfer of learning is often impaired following a TBI, one should attempt to evaluate the person in a job highly related to the job to which they will be placed. Second, a person with problems in executive skills may function well in a highly structured situation, but when unstructured problem solving situations arise, performance may deteriorate dramatically. Placement on the job targeted as the primary goal, or on a similar job offering a realistic but a supportive work environment for a two to three day assessment is highly desirable. At this time, a decision can be made as to the person's ability to perform the associated work tasks and function in the job's psychosocial environment well enough to warrant a continued work trial. If necessary, a work trainer or job coach may be used until the job is learned or until adequate accommodations can be made. In some instances a company may wish to provide an employee who will function as a trainer and interim supervisor during the initial training period. In some cases, this may in fact be funded by programs such as the Job Training Partnership Act (JTPA) which is a program familiar to most placement specialists.

If it appears appropriate for the person to enter the job he or she was evaluated for, a gradual return to work program can be arranged in consultation with medical personnel, company administration, first-line supervisors, union representatives, and rehabilitation professionals. Placement on a situational assessment site should only be completed after a thorough review of functional limitations has been completed. Sensory, perceptual, memory, or social deficits may cause a problem if not a danger (Thomas, 1987). For this reason, a comprehensive assessment of any functional limitations is important to complete prior to initiating a supported employment program. The evaluator who does not consider these factors may find themself to be liable for injuries suffered by the client should an injury result due to negligence.

In summary, a vocational evaluation should begin with observation of work skills in a controlled environment, including use of work samples or specific job samples if available, with eventual integration into the most normalized and least restrictive environment that is feasible. The person with mild residual impairments may exhibit inappropriate social adaptive skills critical to job functioning in addition to necessary work skills, memory, attention, and self monitoring behaviors, but the vocational impact and ramifications of these behaviors may not be clearly recognized in the sterile environment of an evaluation unit.

Social Skills Evaluation on the Worksite

Wehman et al. (1988) refers to the maladaptive social skills exhibited during free time as the "coffee break syndrome." In such cases, the inappropriateness of interpersonal interactions during lunch and breaks serves to exemplify that the person does not "fit in" with other workers and following lunch or breaks, persons who have suffered a severe head injury may need to be redirected to

task and sometimes retrained to do a job due to memory problems. Problems with behaving in a socially adaptive manner is one of the most common problems encountered by head injured persons who are returning to work (Thomas, 1987). Assessment of interpersonal skills is considered an essential element in any vocational evaluation with this population. Refusal to accept that their behavior is awkward or inappropriate can be expected and is best met by use of concrete examples and statements made on supervisor rating forms completed by several supervisors rather than only one (Thomas, 1988).

It is unreasonable to expect a person to consciously attempt to change a behavior unless they recognize a problem exists. Therefore, it is imperative to have the person acknowledge the presence of a problem in order to gain compliance insofar as working to change a problem behavior. Cognitive rehabilitation approaches using dynamics of group interaction appear to be helpful in the identification of such problems (Adamovich, Henderson, & Auerbach, 1985). The expression of resistance and anger is a natural reaction when problem behaviors are identified or when unrealistic job goals are challenged (Musante, 1983). If the evaluator is fortunate enough to have an association with an organization providing concurrent cognitive rehabilitation, this group is an ideal place for the client to discuss supervisors' ratings and feedback from the evaluation. A group process involving other head injured clients is a highly desirable place to discuss work problems and to obtain the support of the group. Feedback of task performance is an essential element of vocational evaluation, because one of the principal goals of the evaluation should be increased self-awareness. The evaluator whose sole caseload is persons with a TBI, or who works with an outpatient clinic or university program providing cognitive rehabilitation should use this resource to process feedback of the evaluation.

Job Seeking Skills Evaluation

If community-based employment is a targeted goal, then job seeking skills assessment is necessary. Job seeking skills assessment should evaluate the ability to use a telephone to search for job leads, review methods of keeping track of job leads and employers contacted as well as the ability to adequately participate in an actual or mock job interview (Thomas, 1986). If a person is unable to perform some or all of the activities associated with seeking employment and interviewing for a job, the involvement of others who can perform these duties on behalf of the client must be made as specific recommendations in the evaluation report. Although this type of assessment is typically reserved for persons who have experienced milder types of injuries, the assessment of telephone use skills is an important job survival skill to observe with any evaluation referral. The job interview skills assessment is also interesting to investigate for persons with more severe head injuries if this is at all feasible, and can provide insights into the person's ability to function in less than highly structured situations.

DEVELOPING THE VOCATIONAL EVALUATION REPORT

A vocational evaluation will only be as good as the report in which observations and recommendations are documented. It is at this point that many evaluators have their greatest problem, because the evaluation report needs to include a great deal of information in a relatively small space. Checklist reports, common in some evaluation summaries, will not provide the depth of information needed to describe the present level of functioning. However, behavior observation forms make a good addendum to the evaluation report. This section will briefly describe a possible structure to follow when a narrative report on a referral who has had a TBI.

It is the evaluator's job to functionally describe any obvious or hidden disabilities in a vocational context and to comment on the likelihood of changing the environment, the person, or the job goal to accommodate functional problems. It is also the responsibility of the evaluator to test the practical utility of recommendations during the course of an evaluation. The evaluator who can document the effectiveness of a recommendation that they are offering will lend more credibility to their report. For example, if a behavior change program is suggested, it should have been tested for effectiveness. If a compensatory strategy is suggested, the impact that this approach had on performance during evaluation should be discussed in the report.

Depending on the type of referral, a report may vary widely in content and length. The important characteristics to include in any report, however, can be conceptualized as falling into three broad areas including:

1. Background information and reason for referral including referral questions.

2. Description of observations and data gathered during the evaluation, including the course that the evaluation took (work sample, situational assessment, etc.).

3. Discussion of evaluation results and recommendations.

A more detailed summary of a vocational evaluation report format is described below.

SAMPLE FORMAT FOR A VOCATIONAL EVALUATION REPORT

Referral History

Discuss source of referral, why the person was referred and specific questions to be answered by the evaluation (1 paragraph).

Background Information

Describe sources of background information such as telephone contacts with former teachers, family or employers or reports reviewed and what was found about functioning prior to the injury and since the injury. Discuss any significant information regarding pre-injury: education, family makeup, work history, disabilities or limitations, as well as major work or social issues such as legal problems or substance abuse issues which may affect work (1-2 paragraphs).

Also discuss postinjury events, beginning with the type of injury that occurred, resulting disabilities and rehabilitation services (occupational therapy, physical therapy, speech, etc.) that took place. Other injuries and resulting disabilities should be covered briefly, but with sufficient detail to acknowledge if these factors need to be considered in vocational planning (1-2 paragraphs).

Results of previous testing should be summarized if applicable, especially if the current assessment was done to compare to baseline assessment (1-2 sentences).

Course of Evaluation

Describe the time spent in evaluation, whether the evaluation was full or part time and the span over which the evaluation occurred (e.g., three half days for three weeks, five consecutive six-hour days). Detail approaches to assessment that were used such as work sample, situational assessment, community-based work trials, etc. If job shadowing, behavior observations or vocational guidance was a significant part of the evaluation this should also be mentioned. In some instances it is advisable to describe the tests used. If a work sample approach was used, specify details about modifications to the standard approach that was required and how this may have affected results (1 paragraph).

Evaluation Results

Begin by discussing any paper and pencil tests administered such as achievement or aptitude testing, paying special attention to precautions which must be considered when interpreting data. Vocational interests should be reported in terms of both tested interest, and manifested or demonstrated interests noted during the evaluation (1-2 paragraphs).

Results of dexterity and work sample testing should describe such things as manual skills, dexterity, range of motion, and other factors described in the Dictionary of Occupational Titles which relate to the jobs for which the person has an interest in and was being evaluated. Special arrangements required during the assessment insofar as supervision, transportation, scheduling, etc.,

should also be described (2-3 paragraphs).

Learning style and optimal learning methods should also be discussed. If auditory learning was described in the neuropsychological evaluation report as a suggested approach, the evaluator should discuss if this was indeed effective, and the degree to which compensatory aids or strategies such as note books or verbal prompting were required. Ability to improve task performance with repeated trials should also be reported (1-2 paragraphs).

If a situational assessment or work trial was part of the assessment, describe the supervisor's opinions of work behaviors and skills. This may be some of the most valuable information for the referring counselor, therefore be sure to provide detailed descriptions of work tasks, job duties, compensatory or remedial strategies employed and potential for employment in the area of the try out. Suggestions for job modifications or ways of providing work instructions should also be offered (2-3 paragraphs).

A discussion of interpersonal skills and supervisory relations should be discussed next. Psychosocial skills are likely to be an area of concern for the majority of the brain trauma referrals that are seen for a vocational evaluation. One of the ways of documenting these types of difficulties is through the use of a behavior checklist as mentioned earlier in this chapter. When it comes time to write a report, these checklists can be used to document specific interpersonal issues that were found to represent concerns by the work supervisor on situational assessments or to the evaluator in the vocational evaluation unit (1-2 paragraphs).

Summary and Recommendations

Finally, a summary and recommendation section which answers referral questions should follow. Generally, this will involve an evaluation of the appropriateness of stated vocational goals and a brief answer to the questions posed at the time of referral. This will often be the most important part of the report, therefore recommendations should be as specific as possible in light of circumstances (3-4 paragraphs).

CONCLUSION

The vocational evaluation of the referral with a TBI does not particularly require special evaluation equipment or tests. In order to conduct the evaluation in a competent manner, however, the evaluator will need to develop a thorough understanding of the mechanisms and consequences of brain trauma and of TBI rehabilitation approaches. Acquiring skills in these areas, though, is not enough. It is essential for the evaluator to remember above all, that the tragedy of head trauma is more than the sum of the acquired deficits and limitations that are observed in the course of the evaluation, but includes the adjustment to

living with a changed self. Demonstrating compassion and positive regard for the client and family who have endured considerable stress and adjustment will go a long way towards preparing them for receiving the results of the evaluation, which in many cases, may be another verification of how things are now different than before.

The changes in the family structure of the TBI survivor, the change in the sense of self, and the difficulty in accepting the new self will require time and continuous adjustments for the person throughout their lifetime. One's life work and perceived value as a worker contributes greatly to self esteem and self-worth. It is for this reason that vocational evaluation and subsequent employment activities are among the most important aspects of a person's return to normalcy and productivity following brain trauma. Since important rehabilitation decisions are often made at the level of the vocational evaluation, advocacy and encouragement are important elements in the evaluation. The words and actions of the person that the evaluator must advocate for may make this a challenging task. The evaluator must be mature and professional enough to realize that many of the behaviors that they will observe in their clients are to be expected following a TBI and must be viewed in this context.

Finally, the vocational evaluation of the TBI referral must be a team effort. In areas where the evaluator lacks sufficient knowledge or skills to make the necessary decisions or to provide the consultation or direction that is needed, a neuropsychologist, medical specialists, and the family of the client should be consulted for input. As the evaluator gains experience in working with persons with brain trauma, they will find that the individual and unique qualities inherent in each new referral will make evaluations with this population a continuously rewarding learning experience.

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Chapter 7

VOCATIONAL ASSESSMENT: A VR COUNSELOR'S PERSPECTIVE

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THE CHALLENGE FACING THE VOCATIONAL REHABILITATION COUNSELOR

The state vocational rehabilitation counselor is faced with the responsibility of coordinating the vocational assessment process to determine the vocational potential for persons with traumatic brain injury (TBI). The unique array of the presenting problems of each individual with traumatic brain injury, the range of availability of assessment resources in different geographical areas, and the relatively recent access of this disability group to the state vocational rehabilitation (VR) system clearly challengesthe expertise of the VR counselor. The counselor is charged with assessing vocational potential, developing vocational goals, and providing the appropriate rehabilitation services.

Two case studies are presented below which illustrate the unique challenge. The counselors must address the vocational needs of these persons while working within their agency guidelines and their personal/professional goal of provision of services to clients.

Two Scenarios

Case # 1: Mary, a thirty-five year old divorced woman, had not worked since her involvement in a motor vehicle accident six years ago. It had not occurred to Mary to consider returning to work until she was referred to the state vocational rehabilitation office by a Disability Determinations Screening Unit. They noted her banking experience and thought Mary might benefit from VR services. When contacted by the assigned VR counselor, to schedule an appointment, Mary told her that she liked the idea of going to work, but thought she would need some help in finding a job due to her physical and memory problems.

A discharge summary from the treating neurologist noted a diagnosis of traumatic head injury with resulting right hemiparesis, visual impairment, and seizures controlled with medication. Despite this medical report, the VR counselor was not prepared for the observable severity of Mary's disability when she met her for the first time. Poorly groomed, she walked with a slow, unbalanced gait, her right arm hanging limply at her side. The right side of Mary's face was flaccid and her right eye remained open and unfocused behind a frosted glass lens. For most of the interview, the VR counselor had to ask Mary to repeat herself, until she gradually became accustomed to her dysarthric speech. No neuropsychological evaluation had been conducted, but Mary self-reported memory problems that sometimes frustrated her. The VR counselor noted that Mary spoke openly about herself, but often went off onto tangential subjects, and interspersed her responses with childish jokes.

The VR counselor was overwhelmed by the multiplicity of Mary's obvious

physical problems and suspected cognitive difficulties. She had heard that clients with TBI were very difficult to work with, and that the vocational outlook was generally poor. With little experience and no clear guidelines, the VR counselor wondered where to begin, and what she could possibly do for Mary, if anything. Mary emphasized her eagerness to get a job, and wanted to know when she would begin to go on interviews.

Case #2: Jim, a thirty-five year old man who had sustained a traumatic head injury in a motor vehicle accident ten years ago, recently requested assistance from the Office of Vocational Rehabilitation after learning from his psychiatrist that placement services were available. He was assigned to the same VR counselor.

Medical and neurological reports dating back to the time immediately following his discharge from physical rehabilitation services were sent to the VR counselor by the psychiatrist. The reports indicated that Jim had no physical limitations, and could resume normal activities. A neuropsychological report from eight years ago noted that Jim was of average to above-average intelligence. Further neuropsychological testing results identified moderate difficulties in planning, organization, and other areas of executive functioning, as well as learning problems that were not memory-related, but more likely attentional in origin. The report by the neuropsychologist also mentioned that Jim appeared to have poor self-monitoring abilities and little social awareness, although the neuropsychologist noted that these impressions were based on observations made during the relatively short testing period.

Jim appeared at the VR office for his initial interview carefully groomed and dressed in business attire. He was well-spoken, clearly quite intelligent, and presented no apparent residuals of his earlier injury. Jim presented his professionally prepared resume to the VR counselor who by this time was wondering why he had been referred to the agency for assistance. According to his resume, Jim had a Bachelor's Degree which he had completed following his injury. Jim explained that the frequent changing of jobs indicated on his resume was due to "bad luck." He then enumerated a series of company closings, staff reductions, and other situations that had contributed to his having to seek other employment. Jim emphasized that he had come to the Office of Vocational Rehabilitation seeking assistance only with job placement.

Discussion

The manner in which the VR counselor approaches the determination of vocational potential of either of these two referrals will set the stage for future vocational decision-making in each case. It is unanimously agreed among professionals working with people with TBI that there is no such thing as a "typical TBI client." However, the two vastly different clients described above,

both with a diagnosis of traumatic brain injury, exemplify two "typical sets of circumstances" under which persons with TBI may ultimately find their way to the VR system. Herein lies the challenge for the rehabilitation professional.

The first situation involves the "Marys," those persons with TBI who have extensive and obvious physical, cognitive, and behavioral problems. Due to the multiplicity of their problems, they may have been viewed as poor candidates for vocational rehabilitation services by both their families and by professionals who worked with them. Consequently, they may not have been involved in any type of vocational program prior to this referral to the Office of Vocational Rehabilitation. They generally have not independently attempted to work since their injuries. As was the case with Mary, frequently it does not even occur to them to independently explore their vocational options. However, when the possibility of working is suggested to them, or they are referred to the Office of Vocational Rehabilitation by an outside source such as Social Security, they have no objection and may even like the idea. They are generally aware that they will need assistance to return to work, but that awareness is frequently limited to the acknowledgement of physical problems, and perhaps difficulties with memory. In addition to limited awareness of deficit areas and their vocational implications, these clients enter the VR system with little self-knowledge of aptitudes and abilities, and poor understanding of the requirements of the working world. This is especially true among young people who have never worked or who have had very limited work experience.

The second set of circumstances involves the "Jims," those persons with TBI who have little if any physical residuals, look fine, and present themselves well. Consequently, they generally have had little difficulty obtaining employment since their injury. For them, the problem lies in job retention, commonly due to a combination of cognitive problems, particularly impaired executive functioning, and social/behavioral difficulties, both of which impact on vocational performance. However, due to their perceived recovery and good self-presentation, individuals such as Jim frequently have not been forewarned of potential problems in either the cognitive or social/ behavioral areas upon resumption of normal life activities. Even when deficits have been identified through neuropsychological testing, it is difficult for these individuals, their families and friends, and involved professionals to anticipate the vocational impact. Upon returning to school or work, these people with TBI often experience what to them are unexplained difficulties that frustrate and confound them, as well as their families and employers.

Frequently a pattern of failure is established that may extend for a number of years, and result in reactive psychological problems including depression and anxiety. Not really knowing what their problems are, and having an impaired capacity to understand their difficulties even when identified, they frequently believe that the problem lies anywhere else but within themselves. Clients such as Jim may reluctantly enter the VR system, vaguely citing job placement

assistance as their goal, but internally resisting the idea of the need for any kind of rehabilitation services.

Defining the Challenge

Each person with TBI presents a unique array of problems that must be explored fully to determine vocational potential and to develop a goal- oriented vocational rehabilitation plan. The challenge for vocational rehabilitation professionals is to effectively assess the vocational potential of clients with TBI. The problem is to neither underestimate the vocational potential of the "Marys" nor overestimate the vocational potential of the "Jims" who will undoubtedly seek services through the VR system. With the inexperienced or uninformed VR counselor, or facility-based counselor/evaluator, it is easy for such under or overestimating to occur. Based on initial impressions, the "Marys" may not be given a chance and may be dismissed as inappropriate for VR services. Without in-depth exploration, the "Jims" may be perceived as competent and job-ready, in need of only job placement services. Both of these responses are examples of inappropriate approaches to the assessment of the vocational potential of people with TBI.

Meeting the Challenge

In order to meet the challenge, the VR counselor must understand the concept of assessment of function. In the case of Mary, the counselor must be aware of the need to evaluate Mary's functional abilities, despite presumed severe performance deficits based on appearance and initial impressions, i.e., her ability to meet the demands of a working situation and the extent to which her banking skills may be intact, regardless of the perceived severity of her disability. Strengths and abilities must be uncovered, along with a determination of Mary's potential for benefiting from compensatory strategies in her approach to work situations. With Jim, the counselor must understand that high level cognitive, behavioral, social, and emotional difficulties frequently follow a traumatic brain injury despite an individual's presentation as completely recovered. These difficulties are often imperceptible in casual conversations or in nonstressful situations, but may result in significantly diminished vocational performance. Despite Jim's excellent self-presentation, the counselor must view Jim's poor work history as a red flag. She must be careful to explore broad problem areas associated with TBI, as well as the specific critical factors identified in his neuropsychological evaluation, which are undoubtedly linked with his inability to retain employment.

These objectives can best be accomplished through a systematic vocational assessment process that is both complex and time-intensive, and that extends beyond the more conventional VR notions of a time-restricted "vocational evaluation" by incorporating a functional, problem-solving approach. The VR counselor responsible for assessment of vocational potential must have a broad

knowledge of the vocational implications of TBI, and the ability to interpret and utilize for assessment purposes the neuropsychological testing results specific to each person with TBI.

Beyond the Neuropsychological

The neuropsychological evaluation is crucial for identifying cognitive deficits, impaired executive functions, and behavioral, psychological, and social issues. These are the factors that have been found to most affect vocational outcome of clients with traumatic brain injury. It is also through the neuropsychological that areas of strength and positive resources can be identified. But it is a comprehensive vocational assessment process that takes us "beyond the neuropsychological" and allows us to examine deficit areas not in isolation but as factors that interplay with each other and with the work environment. It is through a vocational assessment process that emphasizes exploration of identified strengths and mobilization of intact resources in both work-like and actual work situations that the functional capacity of a person with TBI can be explored fully, and a successful vocational outcome can be facilitated. The effective VR counselor guides this process, and ensures that each individual with TBI is afforded the best possible opportunity to fully explore vocational potential, by being knowledgeable of issues relevant to the vocational assessment of individuals with traumatic brain injury.

ISSUES RELEVANT TO THE VOCATIONAL ASSESSMENT OF INDIVIDUALS WITH TRAUMATIC BRAIN INJURY

Vocational rehabilitation counselors are generally well-equipped to determine the vocational potential of their clients in areas of client skills, abilities, aptitudes, and general vocational behaviors and attitudes. At the time of determination of eligibility, according to the VR model, a specific vocational goal or specific career area is established prior to the provision of services.

When working with people with TBI, a different perspective towards the process of determination of vocational potential must be assumed by the VR counselor, one which takes into consideration not only what job tasks the client can do, but how the client is going to function on the job. Then the counselor must discover what contingencies, both ecological and process- oriented, will allow the client to function best at that job. Ecological factors include environmental characteristics such as work site location or level of distraction at the work place, and situational conditions such as level of supervision, job structure, and amount and type of required job- related interactions with others. Process-oriented factors are those directly related to task performance, for example the way a task is organized, and the implementation of compensatory strategies.

Vocational assessment of people with TBI is therefore a complex

undertaking that takes time, and involves assessment and reassessment of function throughout the rehabilitation process. The following premises are considered essential if the vocational rehabilitation needs of people with traumatic brain injury are to be met:

1. Assessment viewed as an ongoing process.

2. Use of an individualized approach, taking into consideration the physical, cognitive, executive, social/behavioral issues associated with traumatic brain injury.

3. Use of a functional/problem-solving approach.

4. Self-awareness as a targeted goal.

5. Expanded role of VR counselor.

Vocational Assessment as an Ongoing Process

Despite a VR structure depicting "vocational evaluation" as a discrete stage of rehabilitation, vocational assessment of people with TBI is best viewed as an ongoing process throughout the duration of a client's vocational rehabilitation. From this perspective, vocational assessment begins at the time of referral and continues on through postplacement services. As the client continues to face new challenges and more complex situations while progressing through the rehabilitation process, new problems can emerge, or known problems can reoccur in different forms. The client may progress through distinct phases of the VR rehabilitation model (assessment, vocational evaluation; planning, services employment, closure; postplacement follow-up, see Figure 1), or receive VR services within the context of the newer supported employment model, but the vocational assessment process continues as the client's performance is monitored and assessed under changing conditions (Figure 2).

It is helpful to view vocational assessment as a series of hypotheses about a client's vocational potential. Each phase of the rehabilitation program becomes part of the laboratory in which a client's functional abilities are assessed. Hypotheses about predicted performance levels may then be modified accordingly at any stage. From this perspective a determination of vocational potential, including designation of a specific goal and anticipated maximum functioning level is made during the final stages of this process. Such a process can be very different and inherently more accurate than a determination made after a discrete, time-limited diagnostic vocational evaluation. Fortunately, the state/federal program of vocational rehabilitation has a mechanism for this process, the **Extended Evaluation**.

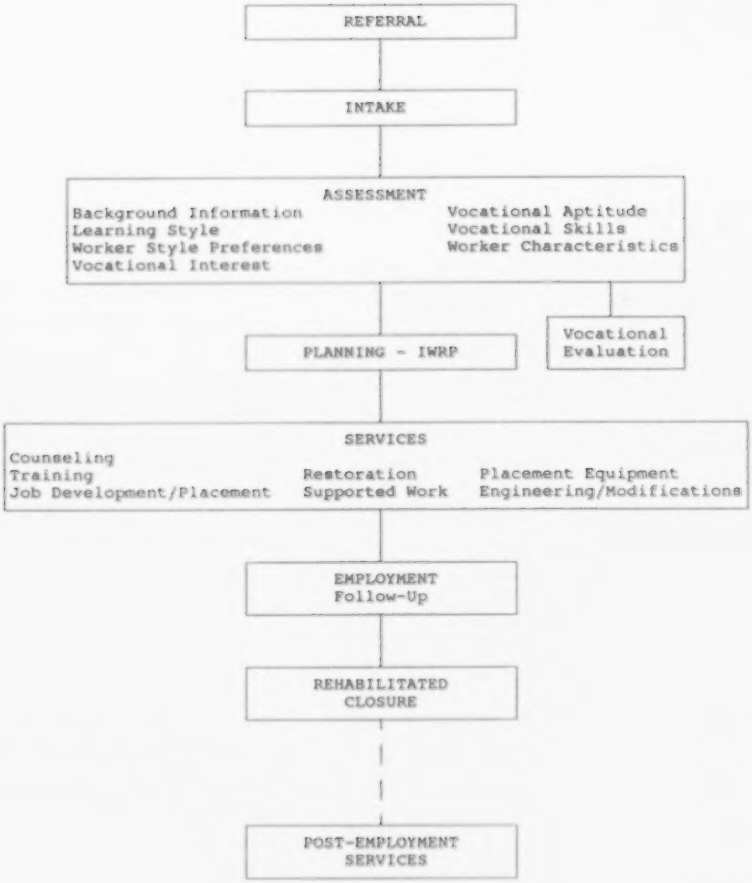

FIGURE 1. Vocational Rehabilitation Process

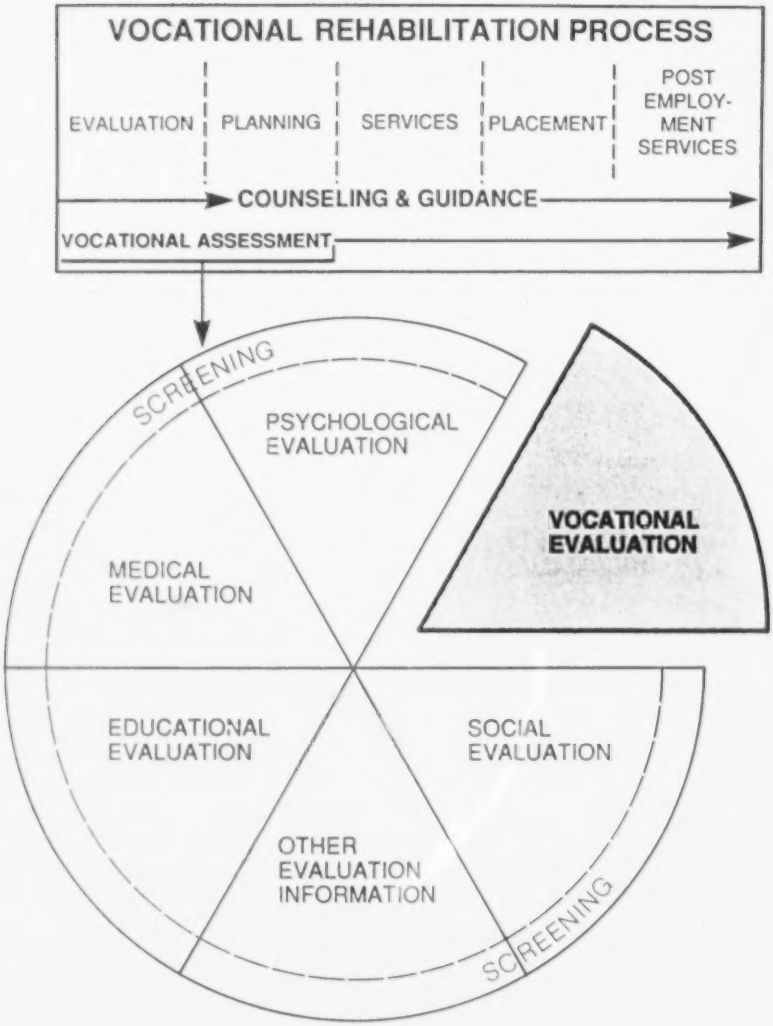

FIGURE 2. Vocational Assessment

An Individualized Approach

Vocational assessment must follow an individualized approach that incorporates issues of most importance for people with TBI. First, the physical, cognitive, executive, and social/behavioral difficulties, associated with TBI must be explored systematically with each client. Research and clinical experience indicates that it is these factors that most frequently affect the vocational performance of people with traumatic brain injury. For example, the possibility of impaired executive functions, including difficulties in initiating, planning, and organizing, must be directly addressed throughout the vocational assessment process to determine: a) Does this individual appear to have this difficulty, and if so, b) to what extent does it affect work performance?

Concurrently, in order for vocational assessment findings to serve as the basis for overall vocational planning, a client's skills, interests, aptitudes, and behaviors must be explored within the context of the specific manifestations of the TBI for that individual. Consequent findings will then address to what extent the individual can use his or her skills, abilities, and aptitudes in a specific career area. Areas of strength, as well as deficiency, need to be identified and capitalized upon as part of this individualized approach.

For the client with TBI with typing skills or aptitudes, who aspires to do clerical work, the general evaluation question, "Can this individual type?" must be broadened to "Can he function as a typist?" Function, not skill, is the important issue. For the individual with TBI, it can never be assumed that the possession of a specific skill, i.e., the ability to type 60 wpm, automatically translates to successful performance of that skill in a working situation, due to the multiplicity of factors that can affect work performance.

The comprehensive neuropsychological evaluation can serve as the basis for assessment of the vocational implications of specific deficit areas. It can provide preliminary information regarding areas of individual strength and compensation that can ultimately facilitate vocational performance. The VR counselor must have a broad knowledge of the vocational implications of TBI, and an understanding of neuropsychological testing results specific to each individual with TBI to orchestrate this individualized approach to the process of vocational assessment.

Use of a Functional/Problem-Solving Approach

The recommended perspective of vocational assessment as a process, extending over time, incorporates the notion of improved performance and overall potential for change over time. Although the importance of assessing function has been emphasized, to fully do so with people with TBI, it is necessary to go beyond a static "snapshot" assessment of function under one set

of circumstances.

A person with TBI may demonstrate competitive skills in a highly structured vocational evaluation setting, yet be unable to perform adequately in a working situation. The purpose of the vocational assessment process is not to "screen out" people with TBI as candidates for VR services. Instead, the purpose of vocational assessment is to determine maximum functioning level. Then an adequate assessment of function must incorporate a problem-solving approach. From this perspective, a primary goal of vocational assessment is to determine what ecological and compensatory factors would enhance a person's functional capacities and lead to a determination of eligibility.

The implementation of compensatory strategies and the adjustment of ecological factors in the work setting make the difference between a non-functional and functional worker. Specific ancillary treatment, especially cognitive rehabilitation, may also be expected to improve performance and alter functional levels in the workplace.

From this counselor perspective, treatment and intervention are not imposed as a prescription following a formal period of "vocational evaluation." Rather, in this proposed broader concept of vocational assessment, treatment and intervention are incorporated into the assessment process and are, in fact, an essential component. To disregard this aspect of vocational assessment, prior to making a determination of anticipated maximum vocational potential, constitutes a disservice to the person with TBI and may lead to the screening out of potentially successful workers.

A critical component of the vocational assessment process for individuals with TBI, then, is the development, implementation, and assessment of interventions designed to maximize a person's vocational performance. This component can best be described as an assessment - intervention loop, in which an assessment hypothesis is made, an intervention is developed and implemented, and the assessment hypothesis is then re-assessed in terms of improved performance (see Figure 3).

ASSESSMENT ----------> INTERVENTION

(REASSESSMENT) (Compensatory strategy or environmental adaptation; specific ancillary service, i.e., cognitive rehabilitation)

FIGURE 3. Assessment - Intervention Loop

The referral question, "How, or with the use of what strategies, does this person function best?" can then be answered through the vocational assessment process.

On the part of the VR counselor, a concept of vocational assessment that includes treatment and intervention as integral components is perhaps difficult to "fit" into the structure of the VR model of service delivery. Newer models of supported employment that assume ongoing assessment are more conducive to the notion. The concept requires a flexible attitude among professionals working with people with TBI. VR counselors, while adhering to the basic VR system, need to be willing to take calculated risks with clients, and must be supported in their efforts to do so. If vocational assessment is going to truly continue throughout the entire course of rehabilitation process, until successful maintenance of placement is attained, it must be understood that initially designated priorities and goals will change as a client's functional performance changes. Performance will change, usually unpredictably, as treatments progress, intervention are tried, and as ecological factors vary. The VR counselor needs to accept and even expect that initial goals will be adjusted up or down based on the emerging profile of the client's improvement and capacity for change through intervention over time.

The concept of an assessment - intervention loop can thus be valid throughout various phases of the rehabilitation process. The assessment - intervention lop is necessary, whether a person is in a formal "vocational evaluation" setting, work adjustment training program, transitional employment placement, supported employment placement, or assisted competitive placement with a job coach. The concept is applicable and will lead to a better determination of maximum vocational potential.

Self-Awareness as a Targeted Goal

It has been documented, both in the research literature and through the clinical experiences of rehabilitation professionals, that people with TBI often display poor awareness of the physical, cognitive and social/behavioral effects of their injury, and demonstrate an impaired ability to self-evaluate their performance. Self-awareness, however, is critical to the rehabilitation process for people with TBI. It forms the basis for the development and acceptance of a suitable vocational goal, helps the individual maintain the focus on that goal, and provides the rationale and incentive for the use of compensatory strategies.

Increased self-awareness is the goal of vocational assessment for all people. Concrete thinking, difficulties making connections, and poor capacity for generalization, among people with TBI, suggest that self- awareness will not develop automatically for them as a natural by-product of the vocational assessment process. Specific measures need to be taken throughout the assessment process, and hence, throughout the entire rehabilitation process, to

encourage the development of self-awareness.

Expanded Role of the VR Counselor

The active role of the referring VR counselor can be expected to be broader with people with TBI. The VR counselor can expect to have greater involvement in case management and advocacy activities with an individual who has traumatic brain injury. This is especially true if there are no family members actively pursuing services or benefits for the individual. The counselor will need to know where and how to obtain services that specifically meet the needs of their client.

One of the initial responsibilities of the VR counselor is typically the determination of appropriateness and timing of VR involvement in a particular case, especially in planning the process of vocational assessment. When referring the client for vocational assessment services, the counselor must understand the vocational implications of the critical factors associated with TBI, and translate that understanding into specific referral questions. The counselor must assume responsibility for monitoring a client's program participation to ensure that critical issues and specific referral questions are being addressed.

If caseload demands permit, the VR counselor can play an especially active and facilitative counseling role in the rehabilitation process with people with TBI. First and foremost, the VR counselor can carefully prepare the client for participation in a vocational rehabilitation program by reviewing key points about the program and answering client or family questions. Information may need to be repeated for several sessions before the actual referral is made, but the VR counselor can in this way help ease the client's transition into a new phase of rehabilitation.

Individuals with TBI generally require a great deal of structure and support as they progress through the rehabilitation process. Their needs can be best met through the combined efforts of program facility staff and by the referring VR counselor. Throughout the client's participation in active programming, in addition to the more classic adjustment issues commonly dealt within counseling, the VR counselor can provide additional structure to the rehabilitation process by: regularly meeting with the client to review goals; reenforcing the client's focus on those goals; and assisting the client with planning, implementing, and following through on desired objectives.

COMPONENTS OF THE VOCATIONAL ASSESSMENT PROCESS

Issues Relevant to the Individual with TBI

Vocational assessment is not a deficit model, but rather a model that stresses functional capacities. Therefore, vocational assessment must emphasize

performance in a work context. The assessment of functional capacities of a person with TBI in a controlled work or work-like setting, including situational assessment and longer term work trials, is the most important component of vocational assessment. To fully assess function, a problem-solving approach exploring increased functional capacities through cognitive retraining, compensatory strategies, and manipulation of ecological factors is used. For the person with TBI, increasing self awareness of deficits and the vocational implications of those deficits is a targeted goal that parallels the vocational assessment process. It is the critical role of the VR counselor to ensure that these issues are adequately addressed as part of the vocational assessment process with individuals with TBI.

Vocational assessment may be described as occurring on several levels. Although they are presented here in sequence, the following components may be conceptualized as processes that overlap or transpire concurrently.

1. Exploring the vocational implications of TBI.

2. Assessment in a controlled work or work-like setting.

3. Problem-solving.

4. Development of client awareness/acceptance.

Exploring the Vocational Implications of TBI

Critical factors related to TBI that must be explored through vocational assessment include physical difficulties, cognitive deficits, and impairments of executive functioning. Of equal importance are the range of behavioral/ psychosocial issues that have been continuously cited as major reasons for lack of maintenance of successful competitive employment. The emphasis in these guidelines is placed upon the cognitive, executive, and behavioral/ psychosocial components, since the physical aspects of disability are more easily understood and assessed vocationally, and have been found to be less salient in terms of problems with job retention. The client's level of self-awareness and any difficulties in self-assessment need to be explored as well.

The prospect of assessing the vocational potential of a person with TBI can be overwhelming to the VR counselor. In order to sort through and make "vocational sense" of the available information, it is helpful to think of critical areas according to the following categories:

1. Problems in performance of work skills.

2. Problems in work behaviors.

3. Problems with self-evaluation.

In some cases it may seem equally legitimate to assign a specific deficit area to either category 1 or 2. The point is not the correct categorization of factors, rather, the organization of information in a way that is useful for describing problem areas with specific clients, establishing treatment and placement goals, and determining methods to enhance functional performance. An initial distinction between work skills and work behaviors also becomes helpful throughout the rehabilitation process when dealing with clients' problems with self-evaluation. By thinking of designated deficit areas in terms of impact on work skills and work behaviors, it becomes possible for the VR counselor to utilize vocational assessment resources designed to explore functional issues.

Specific deficit areas to explore. Following is a list of major critical factors associated with TBI along with questions clarifying functional implications from a vocational perspective. Given the range of possible sequelae following TBI, the list and related questions cannot be considered complete, but can serve as a starting point for assessing vocational potential.

1. Problems that interfere with the performance of work skills.

- **Capacity for new learning** - Includes memory, learning style, learning environment. Can the client acquire new skills? What modality of presentation of new material is most facilitative to learning? What is the carryover from day to day? What is the long term retention? Can the client learn new tasks and then perform previously learned tasks without a relearning phase? Can the client perform them with cues?

- **Planning and organizing** - In terms of both work procedures and work materials. Can the client plan a daily work schedule? A work procedure? Can the client set priorities? Can the client plan and organize work materials and a work area? Can the client carry out a planned activity?

- **Initiative** - Beginning an assignment; moving from one step or task to the next. Does the client independently initiate a task once directions are given? Does the client inform the evaluator or work site supervisor when he needs more work? Does client appear unmotivated or unconcerned?

- **Distractibility** - Both internal and external. Is client's attention easily drawn away from task at hand by external or internal stimuli? Does client's work speed and accuracy improve when he is placed in a quiet, distraction free environment?

- **Maintaining a sustained effort** - Attending to task; follow through to completion. Does the client stick with an activity or does he easily lose interest or become bored? Is the client able to maintain attention and concentration under stressful conditions? When situations are unstructured?

- **Slowness** - Both physical capacity and mental processing. Is client slow to respond in general conversation, or to specific questions? Does the time factor in standardized assessment instruments excessively reduce overall performance scores? Does the client's work pace increase as he/she becomes more accustomed to a task, or is there no change in pace over time?

- **Shifting mental sets** - Alternating among various work assignments. Is the client able to shift from task to task without distress or confusion? Is the client able to stop one task while in progress, perform another task, and then return to the first task and resume working, without having to start the task all over again?

- **Attending to simultaneous activities** - Carrying on simultaneous tasks. Can the client listen and write at the same time, i.e., take notes while someone continues to speak, or write a phone message while the caller is speaking? Can the client maintain a running list of activities in a log while proceeding through daily assignments?

- **Impulsivity** - Includes actions and verbal responses. Does the client begin an activity without waiting for instructions? Without waiting for the completion of directions?

- **Inconsistency or extreme variability of performance** - In terms of work pace, accuracy, level of commitment. How frequently does performance change? Under what conditions?

- **Problem-solving ability** - Recognition of problems or novel situations; dealing with problems once they are acknowledged. Does the client recognize that there is a problem or continue with the task while the problem goes unnoticed? If a problem is detected, does the client try alternative solutions? Does it occur to them that they might try to problem-solve a situation? Can the client recognize errors in work, and does she/he attempt to correct those errors?

- **Ability to generalize** - Task specificity versus transfer of skill. If client can alphabetically file cards in a work sample, can client file charts alphabetically in another location? Is client able to transfer a learned skill to a similar, but novel task or new location? Can the

client profit from experience and apply solutions to new work problems?

- **Specific learning disabilities** - Problems with mathematical abilities; spelling problems.

2. Problems that interfere with work behaviors.

- **Social appropriateness** - Includes disinhibition, quick temper outbursts. Do particular circumstances seem to evoke particular behaviors, i.e., stressful or unstructured situations? Can the client control the behavior(s) with prompting? Is the client aware of rejection by others?

- **Self-involvement** - Includes intense demand to have one's needs met, and difficulty assuming another person's perspective. Can the client wait his/her turn for attention from evaluator or supervisor? Does the client accept that the boss is busy and cannot answer a question immediately?

- **Emotional control** - Poor control and/or poor coping mechanisms. How does the client cope with stressful situations? With unstructured or ambiguous situations? Can they quickly regain control and return to productive activity?

- **Rigidity in thinking, inflexibility** - May be manifested as difficulty shifting gears. Is the client able to try doing a task in a new way? How does the client cope with a change in schedule? How does the person cope with periods of transition, i.e., a change of program, work site, counselor, work site supervisor?

- **Concrete thinking** - Abstracting and conceptualizing beyond concrete details of a situation; lack of awareness of implied meanings and nuances of behavior. Does the client infer meanings from supervisory feedback? Can the client understand and join in with the joking and teasing that is common among co-workers?

- **Judgment** - The functional effect of array of deficits; may emerge in all types of work related situations, often described as a "display of poor judgment" for lack of a more specific descriptor. Does client understand that the boss should not be disturbed if the door is closed? Does client recognize and adapt to dress code and social rules of the work environment?

3. Problems with self-evaluation

- **Awareness of deficits** - Does the person recognize deficits resulting from the injury? Aware of the impact of deficits on specific areas of performance?

- **Understanding of the vocational implications of deficits** - Can the client make the connection that impaired areas of function will impact on vocational performance? On vocational options?

- **Self-assessment of performance** - Regardless of whether or not the client verbalizes an awareness of deficits, do they consistently over or underestimate performance? Does level of self-assessment change with feedback?

- **Unrealistic vocational expectations** - Does the client aspire to unrealistic goals? Do goals remain constant despite counter evidence and feedback? Does the client establish and/or insist upon an unrealistic time frame or method of achieving goals that may be realistic in terms of functional capacity?

It is important for the VR counselor to understand that functional capacities in any of these areas will fluctuate according to changing levels of task complexity, structure, supervision, and perceived levels of internal and external stress.

Functional learning assessment. The capacity to learn and retain new information and skills is integrally related to vocational performance. Reading comprehension and other academic abilities are important to explore, especially with the client who wishes to return to a school setting or pursue further education. It is those factors related to cognitive processing and executive functioning that are most critical in evaluating the learning capacity of people with TBI. Standardized tests are available that identify a person's preferred learning style and modality. (One such test is the McCarron-Dial Perceptual Memory Test). Due to inconsistency of performance, distractibility, problems in unstructured situations, and other confounding variables, it is important to supplement test results with careful observation and utilization of a trial-and-error approach. The skilled evaluator can initially experiment with different modes of presentation of new material, and hypothesize about the person's best learning style. The hypothesis must then be tested and altered as the client moves into a working context with multiple demands. The optimal setting and conditions for new learning can also be defined. The number of steps in a procedure that a client can successfully master, in view of attention, memory, sequencing, or other deficits, must also be assessed.

Other areas of importance include a) carryover of learned skills from day to day; b) retention of learned skills over time, especially after some time has elapsed without opportunity to perform task; c) ability to simultaneously listen to information and take notes; and d) ability to transfer a learned skill to new situations, goals, and plan optimal means towards achieving those goals.

Practical applications. By taking a look at our two original case studies, it is possible to examine how the vocational implications of TBI are explored with two very different clients.

Case #1: For Mary, a recent neuropsychological evaluation indicates that she has difficulty shifting mental sets, short term memory deficits, and problems with organization and planning. Once Mary has demonstrated proficiency in basic bookkeeping skills, it is necessary to determine her potential for accounting/clerical work by addressing the TBI related deficit areas from a functional perspective. Difficulty shifting mental sets can be translated functionally into assessing Mary's performance when she must switch from one task to another. What happens when she is interrupted by a phone call? Does she stop work to answer the phone, which is part of her job responsibility? Can she then find her place in the accounting project and resume her pre-interruption performance level immediately, or does she require a settling in period? Can she relocate her place at all, or does she need to start from the beginning to reground herself in the task? What happens if there are shifting priorities and Mary must quickly stop work on one assignment and shift to another?

Mary's problems with organization and planning could have serious implications given her aspirations to perform accounting work. It would be essential to determine Mary's ability to organize a spread-sheet, organize data for input, plan a daily and weekly work schedule based on fluctuating demands, prioritize her work, and conduct the many other responsibilities associated with accounting/bookkeeping involving organization and planning.

Mary's memory difficulty, identified through neuropsychological testing as a problem of retention rather than attention, must be explored in light of the necessity to learn computer applications in the advancing world of finance. Given Mary's intact bookkeeping/accounting skills based on premorbid learning, does Mary retain better if new material is presented in a context? Do cues in the environment - computer frames, data sheets, etc., allow her to perform tasks she thought she had forgotten? Does repetition over time enhance learning and retention?

In this manner, the broader question "Can Mary function as an accounting clerk?" is systematically explored. Problem factors in the environment, job structure, supervisory issues, training methods, can be identified. Factors that may respond to intervention, including cognitive retraining, use of compensatory

strategies, and environmental adjustments, will also be marked for active problem-solving.

Case #2: For Jim, the most critical aspect of vocational assessment would be the exploration of his work performance in light of the organizational, planning, and other executive function difficulties identified through the neuropsychological evaluation. As with Mary, it would be important to assess Jim's organizational and planning skills on the job. Unlike Mary, however, Jim aspires to a managerial level job in sales and marketing, a job that is very unstructured and inherently stressful. It would, therefore, be important to think about Jim's functional abilities in terms of both structure and stress. Does Jim's ability to plan and organize remain stable or does it deteriorate when he is under exceptional stress? Conversely, does a loss of structure in his work role, when negotiations for a sale break down, for example, cause Jim's stress level to increase, and hence further reduce his ability to maintain control through organization and planning? These are complex questions, but critical to understanding and assessing Jim's failure to retain employment in his chosen field. These questions would best be explored through a carefully constructed and executed situational assessment where external factors could be simulated and manipulated. Possibly, recent employers could provide insight.

Equally important would be a determination of the impact of Jim's poor self-monitoring abilities and impaired social awareness in a working situation. Since he presented himself so well during the initial interview, it would be reasonable to hypothesize that either Jim cannot maintain emotional control consistently over time, or that certain circumstances foster a loss of self-monitoring abilities. Both of these hypotheses can be explored through a sequence of increasingly complex, less structured, and more stressful situational assessment arrangements.

Jim's awareness of his social/behavioral problems, and his understanding of the impact his behavior has on others, especially co-workers and potential customers, must be assessed to determine his potential for interventions that might ameliorate problem behaviors. Behavioral and awareness factors can be initially assessed through observation of individual and group interactions in a highly controlled setting. Situations can be videotaped and jointly analyzed by Jim and the vocational rehabilitation counselor. Behavior checklists can be instituted for self-monitoring and monitoring by the counselor to determine Jim's awareness of which of his behaviors would be considered vocationally detrimental.

Finally, the vocational significance of Jim's attention-based learning problem needs to be explored. A functional learning assessment, as described above, would be the first step. Since the problem has been assessed as attention based, a distinction between internal and external distractors would provide significant

information for determining interventions. As Jim has thought about returning to school, as a way to leave the sales and marketing field, it would be important to assess his capacity for further academic training. Is he a candidate for classroom type lectures where he is required to attend a lecture and take notes at the same time, and do most of the actual learning on his own outside of class time? Or is Jim a person who learns best in a one-on-one situation, with opportunities for hands-on activities and immediate feedback? The answer to these questions is significant for exploring and planning future training options.

Assessment in a Controlled Work or Work-like Setting

Value of in-context assessment. Simulated or actual work site placement provides an excellent opportunity to assess the vocational implications of deficit areas and functional capacities of people with TBI. It is outside the highly structured, one-on-one situation of a testing environment, when the client is faced with the multiple demands of a work or work-like setting, that cognitive, executive function, and behavioral/psychosocial problems become most apparent. Conversely, deficits identified through neuro-psychological evaluation may not constitute a functional problem in a work setting, either because contextual cues allow the client to compensate well for deficit areas, or a particular deficit may not be a functional limitation in a specific vocational setting. For various known and unknown reasons, it has been found that people with TBI sometimes simply do better when provided with a context in which to demonstrate their abilities.

Being called upon to perform in a work-like situation often gives meaning to the assessment process for people with TBI who may have difficulty conceptualizing the relationship between vocational assessment activities and their ability to work. Simulated or actual work site experience provides opportunities for self-assessment and development of self-awareness. People with TBI may not know if they can or cannot do something unless they are allowed to try. A client may rise to the occasion by self-monitoring behaviors that had been predicted as problematic. For example, they may fulfill the self-proclaimed "I wouldn't do (x behavior) if I were at work." In this type of situation, it would be especially important to allow for a longer period of work site placement to assess consistency of behavior and performance over time.

At the other extreme, a person may experience failure or less than hoped for success in a desired job situation. Whereas there are differing opinions within the rehabilitation field about "planned failures," failures in work experiences will occur whether planned or unplanned, and might be most profitable as meaningful experiences if they occur under controlled circumstances, and are handled carefully. People who realizes their performance is not acceptable may or may not recognize the relationship between specific deficit areas and job performance, but usually experience the

related anger, frustration, confusion, or sadness. Through counseling and support, this client can be assisted in identifying areas of personal strength and ability, and in adjusting vocational goals with increased self-awareness. Another person with TBI, with deficits in self-evaluation, who may not be able to recognize poor performance, may become more accepting of the reality of the situation if provided with feedback from a work site supervisor whose opinion is valued.

Between these two extremes, placement in a simulated or actual work experience can outline functional strengths and weaknesses of a particular client. Such placements provide a firm basis on which to plan compensatory strategies and ecological adjustments. The need for ancillary treatment, especially cognitive retraining, may become more apparent through an assessment of a client's performance at a specific job site. In turn, the focus of such treatment can be more functional and job performance related. The use of simulated or actual work experiences within the vocational assessment process allows for full exploration and utilization of the assessment - intervention loop, and can lead to more positive vocational outcomes for people with TBI.

Short-term placements at various simulated or actual work sites can also serve as opportunities for career exploration, especially for those people with TBI who have little or no knowledge of the world of work, or who require concrete, hands-on experiences in order to understand the dimensions of a specific job.

Types of assessment in work or work-like settings. Work performance may be assessed by means of a variety of controlled work or work-like situations. Client needs or program resources may result in choosing one form over another. One of the most effective approaches is to construct an increasingly complex series of assessment situations, while simultaneously following the assessment - intervention loop process. Specific types of in-context assessment include:

1. **Work samples.** Use of specific work samples grouped or in isolation allows for initial observation and assessment of a client's approach to a task, learning style, maintenance of a sustained effort, following through to completion, ability to work independently, recognition and correction of errors, self-evaluation and self-awareness, and the entire range of functional abilities related to work skill performance and work behaviors (see Exploring the Vocational Implications of TBI). Problem-solving and intervention should begin at this level. Work samples also provide initial experiences in career exploration.

2. **Work simulation.** This procedure involves the simulation of the various aspects of an actual job or job setting. To explore deficits that interfere

with work skill performance and work behaviors, the simulation would include aspects of work beyond the actual tasks. This method is useful because the complexity of tasks and the presence and/or intensity of environmental factors such as interruptions, conflicting priorities, external distractors, stress, etc., can be controlled and manipulated. Problem-solving can be conducted in earnest at this level, with initial consideration of ecological factors and the efficacy of adjustments to environmental conditions.

3. **Situational assessment.** For purposes of this discussion, situational assessment involves the placement of a client at an actual work site for a designated time period and with specific assessment goals. Generally, the purpose of a situational assessment is to explore the client's functional capacities within an actual working situation. Frequently, the actual work skills involved are not the main consideration, although one of the goals of situational assessment could be to explore functional skills in a particular career area. Rather, the emphasis is more likely on examining the functional implications of cognitive, executive, and behavioral/psychosocial deficits in the work setting, and on developing, implementing, and testing strategies to compensate for problem areas. As in work simulations, the parameters of the situational assessment experience can be controlled through careful selection, preparation, and monitoring of the site placement(s).

   In order to fully explore the impact of ecological factors on work performance, a person may be placed consecutively at two or more sites that constitute very different work environments. Part of the assessment is to determine what can reasonably be expected from the working world in terms of provision of ecological adjustments, and acceptance of alternative and/or compensatory techniques in the work place.

4. **Longer term work trials.** Placement may be made at a transitional work site for longer periods of time, generally from 2 to 6 months, although the actual time period may vary. By this time, the exploration of the vocational implications of TBI-related deficits has already been thoroughly conducted, but the course of vocational assessment continues with the emphasis shifting to the process of the assessment <---> intervention loop. Cognitive retraining may continue to further enhance functional performance as the client becomes involved in more complex work situations. A longer term work trial allows for observation of performance over time, to determine:

   - Consistency of performance over time.

   - Capacity for improvement (due to increased experience, effective use of compensatory strategies, developing self-awareness).

- Capacity for adapting to novel situations. With the advent of the supported employment model, and in accordance with individual client needs and goals, this process in some instances may occur within the context of a supported employment placement.

Developing a situational assessment site. Situational assessment is not a simple matter of placing a client in a vocational goal related volunteer job site, checking in now and then with the supervisor and client, and hoping for the best. Effective use of situational assessment as a vocational assessment technique involves careful research, planning, and preparation.

Factors to consider in the selection of a site include:

1. Purpose of the situational assessment.
2. Level of supervision required.
3. Ecological factors such as location, distractors, opportunities for interaction with co-workers, etc.
4. Targeted career field, if applicable.
5. Level of complexity of assigned tasks.

Placements are based on specific goals, and sites are selected because of what they can offer to address those goals in an initial situational assessment experience. For example, a client who has never worked, has no sense of self as a worker, and has little awareness of skills and problem areas, would be ideally placed in an unpressured, very supportive work environment with simple, clearly defined job duties. Goals of such a placement would likely center around assessment of vocational implications of deficits, and the development of client self-awareness, rather than skill development.

In a return-to-work situation, where an assessment of specific functional skills based on old learning is important, the actual content of the work and the availability of extensive supervisory intervention and feedback regarding skill performance are the most decisive considerations.

While respecting patient confidentiality, work site supervisors must be carefully prepared for their mission. Preparation includes general training on the sequelae of TBI, provision of information about the specific problem areas of the assigned client, and an outline of the areas to be addressed through this situational assessment. Specific training in supervisory, intervention, and feedback techniques must be provided. It is important that the actual line supervisor, as well as the higher level manager with whom the arrangement was

made, receive the training.

The supervisor must be informed of specific supervisory and training needs of the client, and must be advised and trained in any compensatory strategies or alternative work techniques that will be utilized. On-site job coaching arrangements and planned evaluation and feedback sessions should be scheduled in advance. The work site supervisor has to know that the counselor is available as needed for crisis intervention, counseling, and problem-solving. The same supervisor preparation would be required for longer term work trial placements.

Observation and monitoring of client performance at a situational assessment site must be systematic and goal specific. It is expected that the counselor will make judgments, draw conclusions, and provide recommendations separate from the feedback contributed by the work site supervisor.

It is extremely important to encourage the self-evaluation of performance by the client. This process can be facilitated and have more meaning to the client for goal-planning purposes and development of self-awareness if a format for self-evaluation is provided.

The work site supervisor must not be overlooked as a source of assistance in the development of compensatory strategies, or for the proposal of alternative techniques for the completion of job assignments. Understanding the demands of a specific field of work and the working world in general, the work site supervisor may offer important suggestions about related jobs or alternative work environments that might better match the specific needs of the client participating in the situational assessment.

Problem-Solving and Interventions

What characterizes the best approach to vocational assessment of people with TBI, and distinguishes it from a more traditional approach to assessment, is the incorporation of treatment as an integral part of the assessment process. Treatment in this context includes those interventions designed to ameliorate or by-pass problem areas and enhance the functional work performance of a person with TBI. The assessment - intervention - re-assessment sequence meshes well with the concept of vocational assessment as an ongoing process, and provides a rationale and framework for on-going problem-solving activities as the client progresses through various simulated and actual work settings.

Interventions may be compensatory or ecological. Compensatory strategies are defined as procedures designed and implemented to circumvent problem areas and assist the client in work performance. The strategies themselves may be process oriented, and directly related to executive functioning, or geared toward specific skill or task performance. Use of a carefully structured combination notebook/calendar would be an example of a strategy for a person

who has memory, organizational, and/or planning difficulties. Procedure cards, with one direction per card in a flip-card format, are a strategy frequently used at a work site as a cuing device for completing a specific job task. This strategy would be used with individuals who have difficulty with task performance due to memory or attentional deficits, problems with sequencing, or difficulties following a procedure through to completion.

Compensatory strategies may also be directly aimed towards the amelioration of problematic behaviors. For example, a behavior checklist may be implemented for self-monitoring of breaks, or development of time awareness through the tracking of how long it takes to complete specific work tasks. A repertoire of appropriate responses in actual script format was developed for Jim who demonstrated difficulties with the social aspects of a work setting.

Ecological factors play a critical role in job maintenance for people with TBI, making it essential to answer, "In what setting, and under what circumstances, does this person function best?" A person with TBI may function best in a distraction-free setting, for example. The level of supervision on the job, amount of structure defining a particular job or job setting, or level of required interactions with co-workers, may all be manipulated to best determine the needs of an individual worker.

The problem-solving component of functional vocational assessment involves considerable skill and creativity on the part of the rehabilitation counselor, who is encouraged to confer with the neuropsychologist, work site supervisor, employer, and any other involved professionals for the development of specific interventions. The following are several examples of strategies that have been used in specific situations. The possibilities are endless, and limited only by the creativity, energy, and skill of the rehabilitation professionals involved in a specific case:

1. Problem: Difficulty maintaining a sustained effort.

   Strategy: Pacing with a timer/watch, with timer set to go off at specific intervals; alarms serve as check-points to client.

2. Problem: Difficulty attending to simultaneous activities

   Strategy: Client is taught to complete one task before beginning another; if client must stop activity due to interruption (i.e., telephone call), he is taught to take a moment to mark place with a sticker, or allow himself the time to write a brief note to himself before taking on the next activity.

3. Problem: Social inappropriateness

   Strategy: Extensive role-playing, and videotaping; development of

framework for analyzing social situations and anticipating responses; development of repertoire of scripts of socially appropriate responses, practiced through role-playing and situational assessment. In keeping with the concept of the assessment - intervention loop, compensatory strategies and work environment adjustments are implemented on a trial and error basis. The development of functional compensatory strategies and environmental supports for Mary will illustrate this process.

Case #1 - Mary: The Development of Specific Interventions. Through various assessment techniques it had been determined that many of Mary's bank processing skills remained intact. She could use a calculator, complete numerical posting and reconciliation tasks in a standard ledger format, and explain the accounting principles underlying these processes.

Neuropsychologically identified deficits became apparent in Mary's work performance. Her difficulty in shifting mental sets meant that she had trouble changing from one task to another. To compensate for this problem, Mary was taught to develop a "To Do" list every morning with her supervisor. Time frames and the sequencing of tasks were included. Because Mary continued to have difficulty moving to the next task and required an extensive breaking in period before she could work efficiently at a new task, an additional intervention was planned. To draw upon her intact understanding of accounting principles as a resource, she was provided with written descriptions of various tasks and how these particular tasks fit into the broader picture of accounting principles. It was found that by taking a few minutes to read these descriptions, prior to having to begin that task, Mary could integrate the new task into a context and more effectively make the transition.

This same resource was drawn upon to help Mary compensate for her memory problems which affected her ability to learn the new computer processes that had been introduced to her field since she had last worked. Job analyses of current accounting/clerk jobs revealed that computer skills were crucial. Written directions for computer procedures were provided to Mary, but due to her sequencing difficulties the listing of all directions on one page was not helpful. Changing to flip-cards with one direction per card was much more effective. But it was the anchoring of the new procedures within a context, by explaining to Mary and providing her with written explanations of how these computer procedures fit within broad accounting principles, that was most helpful to Mary. In summary, required new learning was related to intact old learning; procedure cards were provided for daily prompting. Mary also had scanning problems, making the process of locating relevant information on accounting sheets difficult. Scanning techniques taught to her through cognitive retraining improved attention to detail and accuracy but made for a long and tedious process of scanning each sheet. To further compensate, an overlay for the accounting sheets with cutouts revealing only the necessary pieces of information was designed. The cutouts were numbered and color-coded to

match the procedure cards and on-screen data entry locations. Due to Mary's difficulty shifting mental sets, and changing from task to task, it was determined that a highly structured job with routine, unchanging responsibilities would provide the setting for optimal performance. Although Mary's supervisory needs were high during a learning phase, once procedure cards were developed and she had integrated a new task into her body of knowledge, Mary could work independently as long as the structure of her job remained constant. When she was finally placed in competitive employment as a senior accounting clerk, at a much higher level job than could have been anticipated at the start of the vocational assessment process, her employer was informed of Mary's training requirements and need for compensatory procedure cards. He was advised to increase supervisory levels when new job tasks or methods had to be introduced. The employer agreed to meet with Mary for five minutes each morning to develop that day's "To Do" list, and set daily priorities.

A functional/problem-solving approach within the VR structure. The process of developing and testing effective compensatory strategies and determining necessary ecological adjustment, illustrates the extent to which the process of assessment - intervention - reassessment - intervention is a trial and error approach to vocational assessment. "Functional vocational assessment", from this perspective spanned Mary's entire rehabilitation program, beginning with formal testing and work sampling, continuing through situational assessment and transitional work sites, and extending on through her placement on a job. It was necessary to evaluate Mary's functional abilities as she was confronted with situations of increasing complexity. It was the successful implementation of individually tailored interventions that allowed for Mary's progression into more complex situations. Only with successful job retention can it be assumed that the vocational assessment process is complete.

Development of Client Awareness/Acceptance

The development of client awareness and acceptance of deficits is a targeted goal that must mesh with the other components of the vocational assessment process. Increased self-awareness and improved self-evaluative abilities form the basis for the client's engagement in the assessment process, and ultimate willingness to experiment with strategies to enhance performance.

Poor self-awareness may take different forms. Most critically, it is the impaired ability to acknowledge the cognitive and/or behavioral/psychosocial effects of the traumatic brain injury. It is these areas of impaired functioning that are most often cited as the reason why many people with TBI fail to retain employment. In some cases, the person with TBI may acknowledge the existence of deficits but fail to see the vocational implications of those deficits. For example, a client may be aware of the fact of attentional errors on accounting/bookkeeping tasks, but not understand what the error rate has to do

with competency to return to the job as an accountant.

Poor capacity to self-evaluate may result in unrealistic expectations in the determination of a specific vocational goal. Even when the goal may seem reasonable and within the person's capabilities, the person with TBI may have unrealistic expectations about the method of achieving the goal, or the amount of time necessary for goal attainment. A person with TBI may insist on attending college for computer skills when in fact it has been determined that auditory processing (classroom lectures) is required. The person may learn optimally in a one-on-one situation with opportunities to demonstrate new concepts in a hands-on situation and with immediate feedback received.

From these examples, it can be seen that increased self-awareness, the knowledge of one's strengths as well as one's deficit areas, impact significantly on vocational planning and eventual vocational outcome. Improved self-awareness must be a targeted goal throughout the vocational assessment process and a primary concern of the VR counselor.

Techniques to increase self-awareness. Constant and consistent feedback about performance from the VR counselor, facilities counselors, and other professionals can help shape the client's self-assessment of vocational potential. Concrete evidence, in the form of testing results or job task performance, may be presented to the client with TBI, recorded in a notebook, and repeatedly reviewed during counseling sessions in anticipation of a gradually emerging sense of strengths and problem areas. For clients who cannot do so for themselves, connections must be made, perhaps visually as well as verbally, between deficit areas and their practical implications in terms of vocational performance and job options.

Opportunities to perform tasks, both with and without the use of specially developed compensatory strategies, sometimes helps clients understand the usefulness of those strategies. In these situations they can concretely see the strategy make a significant difference in their task performance.

Making a distinction between work skills and work behaviors becomes helpful with clients who have behavioral/psychosocial problems. The counselor must persist in pointing out that excellent work skills are only one measure of capacity to work successfully.

Peer group activities, during which people with TBI have an opportunity to view themselves on videotape, observe the performance of others, and receive feedback from each other is particularly useful. It is frequently the forum in which a person first verbally acknowledges problems.

Sometimes the person with TBI will not know if he/she can or cannot do

something until they try a specific activity in an actual work situation. Or, the person simply does not understand how a particular deficit or impairment constitutes a vocational problem until it is a problem in a work setting. "Planned failure" is not an issue here. Rather, what is recommended is the provision of plenty of opportunities, through situational assessment or work trials, for a person with TBI to experience work in an actual work situation. The person having difficulties with time awareness, who consistently arrives late for a vocational program, may insist they would be on time for work. Having difficulties with punctuality at a work site may convince them that a particular problem exists and they need to use a compensatory strategy for being on time to all appointments. The accountant with persistent errors in calculations may perceive the vocational implications of this deficit if the errors are deemed unacceptable by a work site supervisor.

Efforts made to develop self-awareness and self-evaluative abilities in Jim, one of our initial case studies, will illustrate the importance of this process.

Case #2 - Jim: The development of self-awareness. Jim required a step-wise program for the development of self-awareness. He had poor awareness of both the cognitive and behavioral/psychosocial effects of his injury, although he had a vague notion that he did not know how to go about implementing any of his business ideas. He acknowledged problems in social interactions, blaming them, however, always on the other party involved.

First Jim needed to understand that the problems existed. His rehabilitation counselor helped him review the twelve jobs held to determine which job had been most successful and why. Using this positive approach circumvented Jim's defensive posture concerning loss of jobs, and he could critically analyze the "successful" job for both positive and negative aspects. From this analysis, problem areas Jim needed help on were as follows:

1. Difficulties in unstructured situations, marked by an inability to plan and organize for himself.

2. Difficulties with problem-solving, especially under stressful circumstances.

3. Difficulties with attention and concentration when preoccupied by personal issues.

4. Difficulties in social interactions, especially when receiving instructions from his boss or co-workers, which made him feel belittled and "stupid."

5. Strong verbal responses when he felt defensive or attacked.

Jim had an easier time acknowledging his attentional difficulties and

problems with executive functioning. He responded well to the use of flow charts and other procedural guidelines for planning and implementing work tasks, and learned to use a categorized notebook for organizing notes related to key areas of his program.

Although Jim could acknowledge social and behavioral problems, he had great difficulty understanding and accepting the vocational implications of the problems, and expended much energy defending his actions. Initially, a behavior checklist was used. Jim completed it on a daily basis for tracking the occurrence of problem behaviors and to help him realize the extent to which impulsive responses were a part of his behavior pattern. At first, Jim would defend each behavior as justified given the situation in which it had occurred. After the notion of "content vs form" was introduced, that is, his feelings were validated while his form of response was questioned, Jim became more willing to explore alternative responses when feeling angry or frustrated.

Role playing and videotaping strategies were used to assist Jim in assuming the other person's perspective and observing how his behaviors could be perceived by others. A structured process for analyzing social interactions was developed to provide Jim with a strategy for dealing with his impulsivity, planning appropriate responses, and anticipating reactions. He and his counselor jointly developed a repertoire of appropriate responses in script format which he eventually learned to use after internalizing a "STOP! THINK! ACT!" red flag strategy to short-circuit his impulsive and volatile response pattern.

Jim was gradually introduced to increasingly complex work-like situations for opportunities to practice responses. The actual job provided direct observation. There it was clear that Jim had difficulty generalizing and would have difficulty coping with novel situations, and could never have enough scripts to cover all possible circumstances. Ecological factors were then examined.

Jim's awareness of the need for the following recommended ecological adjustments was heightened by a review of the analysis of his "most successful job" and was encouraged through explanation and concrete experience.

1. Placement in a highly structured job with distinct job responsibilities, and few opportunities for independent problem-solving.

2. Clear lines of communication with co-workers, with Jim knowing who to go to for what purpose.

3. Communication with co-workers at a minimum, and communication activity restricted to exchange of information, rather than assistive or persuasive in content.

Jim began to recognize that at stress points in his life it was critical for him

to maintain his daily structure (keep appointments, follow work schedules, etc), as the structure helped him curtail impulsive behaviors, and loss of structure only led to increased anxiety and stress.

Equally as important as the implementation of compensatory strategies and recommended ecological adjustments was the development of Jim's awareness of his cognitive and behavioral/psychosocial deficits. Self-awareness provided the basis for his acceptance of the need to use strategies; improved ability to self-evaluate led to better self-monitoring of problem behaviors; self-awareness led to recognition of the type of work environment, apart from the actual work skill involved, that would be most conducive to his ultimate vocational success.

It must be noted that in spite of planned and concerted efforts, on the part of rehabilitation professionals, none of these techniques may work, and the client may proceed through various phases of the rehabilitation process unaware of the quality of their work, or how they are perceived by others. However, the development of self-awareness including an acknowledgment of the effects of the injury and a willingness to lower expectations or follow different routes to achieving goals because of those effects, has consistently been related to successful vocational outcome with people with TBI. It should be a targeted goal of the vocational assessment process.

This case study involving Jim and the specific steps taken to develop his self-awareness illustrates the inter-relatedness and concurrence of the different components of functional vocational assessment--situational assessment, problem-solving activities, and development of self-awareness.

VOCATIONAL ASSESSMENT OUTCOMES

A Cautionary Note

An attitude of ongoing assessment throughout the entire rehabilitation process from referral through post employment phases of a client's program has been proposed and continues to be strongly urged. Yet it is recognized that according to the VR model, "vocational evaluation" results must be compiled and a formal "evaluation" report submitted in a timely manner fairly early on in the rehabilitation process for determination of eligibility for VR services. In some cases, the time frame for formal evaluation may be extended to allow for situational assessment, but usually not long enough to allow for the extended periods of on-site evaluation and problem-solving suggested here as constituting meaningful vocational assessment.

This situation constitutes a dilemma for program personnel who are striving to provide effective assessment and rehabilitation services. VR counselors attempting to meet the programming needs of their clients with TBI and yet work within their approved guidelines and agency framework of services may

become frustrated.

One way to accommodate both perspectives is to generate the vocational evaluation report following the VR-designated period of "vocational evaluation," but ensuring that the evaluation has included ample opportunity for situational assessment. Findings that emerge from this phase of vocational assessment would form the basis for vocational planning, goal development, and recommendations for areas requiring further intervention and problem-solving. Based on these findings and recommendations, a determination for eligibility could be made and a broad career area, or specific job goal, if possible, could be defined. From the perspective of the VR counselor, the vocational assessment process would continue as the client proceeds through various phases of rehabilitation programming, right through placement and postemployment services.

It is important to record evaluative findings, hypotheses, short-term goals, and long range predictions. However, it is equally important to continue to maintain an attitude that findings reported in the " Vocational Evaluation Report" are indicative of the client's functioning at that specific point in the rehabilitation process. Professionals working with people with TBI must understand that assessment findings, goals, and recommendations proposed at the time of the report may no longer be accurate or appropriate once the client has progressed through a longer term work trial during which executive functioning, skill performance, behavioral issues, and overall performance would be expected to change with successful intervention. A flexible attitude is required to accept, even expect, changes in goals and level of aspiration, as a more consistent and predictive pattern of the client's optimal functioning level emerges over time.

Development of the "Worker Profile"

Perhaps the most useful compilation of assessment information, for purposes of eventual work placement and successful job retention, is the development of a written "Worker Profile" that gradually evolves throughout the assessment process. The Worker Profile is a document that initially is developed jointly by the client and the evaluator. As the client progresses through the rehabilitation process, and benefits from intervention and problem-solving proceedings, the information outlined in the Worker Profile is adjusted to reflect the client's changing functional status. Input from cognitive therapists, neuropsychologists, and work site supervisors is later solicited and gradually integrated into the Profile. The Worker Profile can be viewed as the culmination of the assessment process.

The purpose of the Worker Profile is to record in written form, with maximum input from the client, the following information about the functional capacities of that client:

1. Specific work skills and other positive attributes.

2. Preferred learning style and optimal learning situations.

3. Effective compensatory strategies that maximize performance.

4. Functional needs (i.e., notebook for recording instructions, etc.).

5. Required levels of structure and supervision on the job.

The Profile is therefore a description of the client as a worker, and includes specific procedures and conditions that allow for optimal functional performance. All categories are expressed in positive functional terms.

The development of the Worker Profile relies on and is reflective of the client's level of self-awareness, but is also a strategy for developing and reinforcing self-awareness. The document is prepared for the benefit of the client as a written record of what is needed to function optimally in a work setting. The client is encouraged to use the information included in the Profile as the basis for explaining the use of compensatory strategies on the job, and for obtaining needed supervisory support, without diminishing self- esteem or positive self-presentation as a competent worker.

A look at Mary's Worker Profile, which was updated several times during the course of her rehabilitation program, illustrates the usefulness of such a document in anchoring the client in the reality of her work capacity, strengths, skills, and functional needs.

Case #1 - Mary: The Worker Profile

1. Skills/attributes

   a. Specific bookkeeping/accounting skills (listed).
   b. Computer skills (listed).
   c. Positive worker traits: Dependable, reliable, steady worker.
   d. Independent worker once provided with daily schedule and priorities.

2. Preferred learning style

   a. Learning is best when new tasks are presented within a context.
   b. One-on-one instruction, with opportunities for hands-on practice and immediate feedback.
   c. Provision of written instructions to refer to during learning phase.
   d. Ample opportunity for practice.

3. Strategies

   a. Finish one task before starting another.
   b. Follow daily "To Do" list, with tasks checked off upon completion.

4. Functional needs

   a. Procedure cards in flip-card format, one set per task.
   b. Overlays for data information sheets.
   c. Enlarged computer key-pad for numerical data entry.
   d. Written overview of department procedures.

5. Structure/supervision needs

   a. Work best with highly structured, routinized tasks.
   b. Daily supervision for development of "To Do" list in priority order.
   c. Availability of supervision when problems arise.

Mary's initial Worker Profile would be valuable for job development purposes and for preparing her for eventual job interviews. The Profile would continue to be up-dated throughout follow-along and other postemployment phases once employment is obtained to serve as the basis for future job changes. Development of the Profile throughout the course of assessment serves as a technique for promoting and reinforcing self-awareness of strengths and benefits of strategies.

With Jim, an emphasis evolved around ecological factors. Jim's behavioral/psychosocial problems were extensive, and his ability to self-monitor faltered under stress or in unstructured situations despite intense efforts at intervention and Jim's increased self-awareness. Section 5 of Jim's Worker Profile stressed his needs for structure and supervision.

Case #2 - Jim: The Worker Profile

5. Structure/supervision needs

   a. Highly structured work environment, with distinct job responsibilities and clear lines of supervisory and other inter-worker relationships.
   b. Interactive with things, rather than with people.
   c. Repetitive job, with high skill level content.
   d. Availability of supervision when problems arise.
   e. Required interactions limited to exchange of information, rather than persuasion or negotiation.

What emerged was the realization that Jim required a highly structured job and work environment. Jim lowered his expectations, but the targeted job

needed to be of interest to him and somewhat challenging because of his level of intelligence and need for status. Some type of computer work, perhaps requiring retraining, became a targeted goal. It would be expected that this section of the Worker Profile would become more clearly defined as Jim's career goal became more specific, and his performance in an actual employment situation could be assessed from a problem-solving perspective.

SUMMARY

As increasing numbers of individuals with traumatic brain injury seek assistance from the state VR agencies, the VR counselors must be expected to provide services that effectively address the issues of most importance to this specific population. Through increased knowledge of the physical, cognitive, executive, and social/behavioral difficulties associated with TBI, and an understanding of the need to approach vocational assessment as an ongoing process throughout the various phases of vocational rehabilitation, these counselors can facilitate the state VR agencies' responsiveness to individuals with traumatic brain injury. It has been proposed that the most effective approach to the vocational assessment of individuals with TBI is one that incorporates a functional, problem-solving perspective and promotes maximum client involvement and the development of self-awareness. Such an approach requires commitment, flexibility, and a willingness on the part of the counselors to meet this most difficult challenge.

Editor's Note: Figures 1 and 2 are used with permission from the Fourteenth Institute on Rehabilitation Issues, The use of vocational evaluation in VR. Menomonie: University of Wisconsin-Stout, Research and Training Center.

Section III

TREATMENT AND PLACEMENT

Chapter 8

PREPARATION FOR PLACEMENT

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INTRODUCTION

As a result of information obtained from evaluations described in the previous section, various types of interventions may be recommended as necessary to move your clients toward the goals of vocational placement. Within the constraints of purchasing services, counselors must rationally choose between a multitude of treatment options. There are numerous questions that will come to mind regarding the service needs of a person with traumatic brain injury (TBI). These include:

- Does the person require an extended evaluation period?
- Does work adjustment training seem warranted?
- Is a day treatment program more suitable than individual cognitive rehabilitation?
- Is it important for the family to receive counseling?
- Is it time to consider driver training?
- Will the client's desired vocational goal be too difficult to obtain in light of the deficit areas?
- Is therapy needed to help the client become more realistic about known capabilities?

These are only a few examples of the many questions that arise in determining an appropriate vocational plan. To make it even more confusing, different evaluations obtained may recommend different treatments, thus requiring counselors to be knowledgeable of all the various treatment options. The purpose of this chapter is to delineate these intervention possibilities: work adjustment training, cognitive rehabilitation, psychosocial training, cognitive counseling, family therapy, skill training, education, and traditional rehabilitation treatments.

WORK ADJUSTMENT TRAINING (WAT)

Although most of us cope with the rigors of the everyday business world reasonably well, and accept the ups and downs of our jobs, there are those people who may have difficulties handling these stresses and strains of the daily work experience.

Work adjustment training programs were developed to assist people with disabilities, who need some assistance with re-integration into the community, or maintaining themselves in a work environment. A program of work adjustment training, designed to serve persons with traumatic brain injury, can accomplish the same goal. A program such as this must acknowledge the unique changes in the individual caused by their injury. It should provide an array of services in a supportive, structured, work-oriented atmosphere for those persons with traumatic brain injury who are interested in employment.

A small client/staff ratio is important in the design of this type of program. It allows dedicated blocks of time for staff for observation of an individual's performance and creative problem-solving. For example, behavior and conduct problems may have been identified as a barrier to vocational success. Staff then need to identify antecedent conditions to these maladaptive behaviors and develop appropriate intervention techniques. Inclusion of these intervention strategies into the individual vocational plan and the degree to which a client incorporates these strategies into their repertoire of work and production behaviors is important and useful information.

Another example of the importance of a small client/staff ratio is allowance for closer observation of how a person with traumatic brain injury plans, organizes, and initiates their daily tasks. Loss of some degree of executive function is associated with a large number of traumatic brain injuries. In a vocational setting, the lack of initiating behaviors around work and production behaviors may be classified erroneously as a lack of motivation or commitment on the part of the client. By closely observing how the client organizes and completes assigned tasks, compensatory strategies may emerge that enhance an individual's productivity.

Situational Assessment

The purpose of this program component is to gather information about a client. This part of the preliminary assessment can be accomplished with the receipt and review of various reports such as those generated by vocational evaluation, neuropsychological assessment batteries, work capacity evaluations, medical/social histories, and other vocational and related information. It is also accomplished through the use of a series of situations which involve both real and simulated work tasks. There should also be a process to assess their attitudes, skills, and vocational perceptions which all contribute to employability.

During a situational assessment is also a time to begin the process of identifying and observing an individual's learning style. A learning style assessment will identify the best way of helping the client learn new work behaviors or methods. For example, do they learn best when information is presented verbally, in writing, by demonstration, or through physically performing the tasks. In some cases, if a degree of impairment is identified in the client's sequencing abilities, it is important to assess if chaining is an effective way for them to learn. If so, is forward chaining or backward chaining more effective in light of the individual's specific deficits. The situational assessment phase of the program may last anywhere from two to eight weeks to get a true picture of the persons stamina, skills, perseverance, and other factors important in job retention.

Initial Work Adjustment Training

The work adjustment phase of the program varies in length from several weeks to several months based on numerous factors such as complexity of identified problem areas, appropriateness of identified vocational goals, ability of the client to actively participate in their program, degree of family involvement, amount and type of community-based support programs available for persons with traumatic brain injuries.

The work adjustment program begins with the development of an individual vocational plan (adjustment plan) which is designed to address issues identified during the assessment period. The plan should have the ability/ flexibility to be modified so additional issues may be addressed that emerge over the course of an individual's program. This program phase also allows for the identification of a functional level of an individual's interpersonal skills, strengths, and deficits. Social skills and personal conduct are significant work related behaviors that impact on the level of overall job performance of any employee. However, for many persons with traumatic brain injury, social skill and personal conduct problems are critical to employment. These behaviors need to be examined, potential problem areas identified, and contingencies developed for use with community placement options.

A person with traumatic brain injury may have a great need to improve stamina and endurance. If so, work hardening and work capacities are necessary parts of an individual's treatment plan and will provide information that will be useful when the job search begins in earnest. Staff observation of work and production performance from a physical capacity and tolerance point of view can be applied to the development of individual treatment plans and placement options. For example, does work performance deteriorate as the day progresses?

The time frame of this program phase is more open ended than for persons with other disabilities. Consequently it allows for a degree of trust to develop and the framework of a therapeutic relationship to emerge between the client and the program staff. This counseling relationship allows for the client and the work adjustment program specialist to explore the implications of traumatic brain injuries as they relate to vocational re-integration. The development of trust is important when the staff works with clients to assist them to begin to accept certain changes and limitations imposed by the traumatic brain injury. In accepting that there are limitations, the client becomes more willing to learn and to utilize compensatory techniques and strategies to enhance work and production performance. If there is trust in the relationship, then the client may, because the counselor asked them to, try activities they feel are beneath them, or beyond their capacity.

Group work. Both process and didactic groups are useful to deal with assisting clients in evaluating personal performance and placement options, and should be one of the approaches utilized during the course of the program. Is the client able to handle the distractions always part of the situation when working closely with others? Can they share, interact appropriately, be accepted as a group member? How can they modify their behavior to improve their acceptance and production in group situations, what methods help them control difficult behavior, are questions best answered in a real group situation.

Volunteer placement. A transitional volunteer program may offer placement opportunities that could serve as a work experience, as a further assessment of job performance in a community-based setting, and/or as an opportunity to explore a variety of career and job options.

Family involvement. The members of a client's family or significant others are an important part of the work adjustment and community reintegration process. They are a valuable source of information and a valuable resource. They should be included in the treatment process whenever possible.

Placement/employment. Once the participant in the work adjustment program meets their identified vocational goals and objectives, and demonstrate their abilities through performance both in the program and at the transitional volunteer program, they should receive the assistance necessary to secure and maintain employment. Because of the close observation of an individual's performance by staff and the development of a clear picture of their performance in prevocational/work adjustment training programming, this information is utilized during the placement phase. A thorough job analysis and comparison with identified strengths and challenges will facilitate the structuring of the job tasks so as to minimize deficit areas and maximize productivity and job satisfaction.

MODEL FOR COGNITIVE REHABILITATION

Definitions

Cognitive rehabilitation is a type of therapeutic intervention that focuses on teaching the patient "how to learn" by evaluation and implementation of appropriate processing techniques. The emphasis should initially be on the client's "method of processing information," later changing to the development of compensation techniques that lead to an acceptable product, such as a skill, verbal response, job task, etc., (Wood, 1987). Among the deficits that are the focus of this therapy are: attention and concentration, memory, learning, problem solving, comprehension, auditory and visual perception, communication, planning, organization, and judgment.

Although the term cognitive rehabilitation appears to be the most widely used term, there are numerous others that are used interchangeably in the literature. Cases will be used to exemplify these differences, as well as to raise questions that will be addressed later in this chapter.

Neurotraining and cognitive retraining, by incorporating the term "training," imply emphasis on meeting the deficit head on and restoring it to a functional level. The flexibility of function within the central nervous system provides the theoretical basis for the "deficit oriented" approach. Clients are involved in training tasks that may not appear relevant to the real world but which are purported to develop that skill.

Case Study: Susan

Susan, an eighteen year old adolescent, was injured in a motor vehicle accident the summer after she graduated from high school. She was rendered comatose when her head hit the window on the passenger's side resulting in an impact to the right temporal-parietal area. She received six months of extensive inpatient rehabilitation, but her insurance coverage would not allow outpatient services. While in high school she had worked part-time for a small insurance company writing up applications, filing, and typing. Her supervisor agreed to hire her full time based upon the excellent work record she had with his operation in the past. He subsequently discovered that applications had missing information, letters had numerous misspelled words, and customer records were misfiled. After numerous attempts to point out these errors with little to no improvement, Susan was told that the previous clerk-typist was returning to take over her old job. She later learned that they hired someone who had never worked with the company. In the meantime, she got a job at the local ice cream parlor working 15-20 hours a week. After a customer complained that her portions of ice cream were uneven and not at all like what others were serving, her hours were gradually reduced to 4-5 hours on the weekend.

At eighteen months postinjury, Susan contacted her local vocational rehabilitation office and asked the assigned counselor to send her to school to become a computer programmer. The counselor authorized a neuropsychological evaluation to determine current status, as well as possible therapeutic needs. The results indicated that Susan's language skills were relatively intact, but that she had moderate to severe problems in visual-spatial discrimination, visual organization, and general problem solving. The neuropsychologist recommended cognitive retraining to include six hours of therapy a week. This six hours included two hours of visual-spatial training with puzzles, blocks, and fine motor drawings. The additional four hours were devoted to working on computer software designed to retrain those deficit areas.

After two months of therapy, Susan became discouraged and returned to the counselor, saying that she had already done these types of activities in the

rehabilitation facility and she did not see how they were going to help her become a computer programmer. The counselor went back through the hospital records and determined that very similar techniques had indeed been tried for four months in the rehabilitation center. Both occupational therapists and cognitive rehabilitation therapists within the psychology department provided 2-3 hours per day of visual-spatial training. The treatment plans indicated that progress had been made, yet the deficits were still present at 18 months postinjury.

The vocational rehabilitation counselor had several dilemmas to solve while working with Susan. Some were:

1. Is this cognitive retraining approach leading to skills that will generalize to the real world?

2. If so, how much longer should therapy be authorized?

3. How do you know you are purchasing the most appropriate services?

Cognitive remediation is also a general term used for a therapeutic intervention of cognitive deficits. With the term remediation, one still expects that deficit areas will be addressed from a remedial standpoint. However, there is a broader suggestion of the type of strategies that may be utilized.

Case Study: John

John is a twenty-four year old who drove his motorcycle into the back of a truck late one night while coming home from a party. He was a carpenter who was between jobs at the time of the accident. His motor vehicle insurance covered the three weeks in the acute care hospital where he came out of the coma after three days. Further rehabilitative services were not available and his physicians reported they were very pleased by his excellent recovery. John went home to live with his girlfriend, and in six weeks began looking for a carpentry job. Over the following two years John secured more than a dozen jobs, but they did not last more than three months at a time. A friend of John's girlfriend recommended the assistance of the state office of vocational rehabilitation. He was initially reluctant, but finally agreed to go after he was fired following only four days on his latest job.

The work evaluator indicated that John had the skills to do carpentry work, but that his ability to follow directions would be a problem on the job. The neuropsychological evaluation supported this analysis. John had adequate visual-spatial skills for synthesis and analysis, organization, discrimination and motor construction. On the other hand, auditory memory, particularly in the area of encoding (taking in information), was deficient. Cognitive remediation for memory was recommended.

Auditory Memory

The counselor was somewhat leery of a suggestion for memory training, as he had spent a large sum of money on a previous head injury case and the client's memory difficulties were not remediated (cured). The prospective therapist, however, explained that there would be a small amount of time spent on retraining auditory encoding of information, while the bulk of the sessions would involve the remedial procedure of applying compensation techniques. For example, John was taught to translate auditory directions or input immediately into visual information, (i.e., write down instructions and mark off completed tasks). He was trained to keep a calendar with a place to maintain a daily "Things to Do" list. In essence, his strong visual discrimination and memory skills were utilized to assist his deficient auditory abilities.

The dilemmas that the vocational rehabilitation counselor had to solve with John included:

1. Will John maintain these compensation skills out in the real world?

2. Will John's next employer give John time to write down verbal directions?

3. Was John's failure in previous jobs strictly related to his auditory memory problem?

Cognitive rehabilitation is probably the most widely used term, as well as the one that provides the broadest interpretation of this therapeutic area. The use of the word rehabilitation, as opposed to retraining or remediation, can imply an entire gamut of cognitive treatment services from coma stimulation to job interviewing skills.

Case Study: Melody

Melody is now a twenty-one year old high school graduate who had worked for two weeks as a bank teller at the time of her accident. Her health insurance had not gone into effect for her new job. She was riding in a cab which was struck broadside by an uninsured driver. Over a two year period her car insurance and the cab insurance had taken care of her rehabilitation. She had been comatose for ten days and had received two months of inpatient rehabilitation and six months of outpatient cognitive rehabilitation therapy. She had been discharged as ready to go back to work.

At nine months postinjury, she moved to another state to live with her older sister. She later told her counselor that she and her mother could not get along after the accident. Melody had difficulty finding a job she really wanted and for which she was adequately trained. After "quitting" a number of jobs, she was referred to the State Office of Vocational Rehabilitation. She was now three years postinjury, had never held a job more that 2-3 months, and needed to move because her sister would be getting married soon. She wanted her counselor to send her to school for secretarial and data entry training.

The counselor authorized a neuropsychological evaluation to determine her current capabilities. She obtained an intellectual score in the superior range (Full Scale IQ 124). Neuropsychological functions were only mildly impaired in the areas of attention and concentration, self-monitoring, and visual organization. Memory capabilities appeared within normal limits, as did language, sensorimotor skills, and higher level hypothesis testing. Luckily the neuropsychologist, who did the evaluation, realized that what appears to be mild impairment in a person of superior intellect could still cause difficulty in a work setting. The psychologist suggested that the counselor obtain a work evaluation, primarily to observe behavior in a simulated work setting, and that former employers be contacted to provide a description of Melody's work habits.

The work evaluation revealed above average capabilities in all work samples and tasks. However, by the end of the week all the other clients in the work evaluation group had isolated themselves from Melody, saying that she thought she was better than the others, and that she was critical of them in most of her interactions. The reports from former employers reported excessive talking, bossiness, apparently adequate capability but little follow-through, and paranoia. In general, she was considered a "trouble maker." None of these problems were ever brought up by Melody in her discussions with either the VR counselor

or the psychologist regarding her job performance. When Melody was challenged on these observations, she explained her behavior as the result of "inappropriate" actions of others.

Talking Too Much

As a result of these findings cognitive rehabilitation was recommended. The counselor was concerned about paying for more cognitive therapy because Melody had such mild deficits. However, it was explained that the intervention techniques would primarily include psychosocial skills training focusing on interactive skills with employers and fellow employees, as well as working on organization and task initiation on the job. These types of activities were to be followed by a work adjustment program.

The vocational rehabilitation counselors dilemmas with Melody included:

1. Can the counselor justify cognitive rehabilitation therapy after she had received extensive cognitive retraining and been discharged as job ready?

2. Can these types of psychosocial skills be modified effectively?

Other terms that may appear are cognitive-communicative therapy and cognitive therapy. The first term is used primarily by speech and language pathologists to describe a type of cognitive therapy that is concerned with the management of cognitive-communication disorders. These disorders were described by members of the Committee on Language Subcommittee on Cognition and Language when they met at the ASHA (American Speech-Language-Hearing Association) National Headquarters in October of 1986 (ASHA, 1987). They described the cognitive impairments which may affect language as including all of those areas that are typically addressed in a general cognitive rehabilitation treatment plan.

The second term, cognitive therapy, is another general term that has become synonymous with cognitive remediation or cognitive rehabilitation. Those of us in the rehabilitative field tend to think immediately of the therapy that involves injury to the brain. However, there is a type of counseling or psychotherapy also called cognitive therapy that is practiced by a group of psychologists who endorse a therapeutic style that focuses on the patient's cognitive processes. This psychotherapeutic style is often used effectively with persons with head injury, but is not synonymous with the rehabilitative therapy that assists clients in addressing problems that are organically based. It is important for those involved in vocational rehabilitation to know this distinction and to not use the term cognitive therapy in the place of cognitive rehabilitation therapy (CRT) with people that may potentially confuse the term. For example, a counselor may see that his head injury client is being seen by Dr. Brown. At some point you may talk with this doctor to obtain further information about your client. You may ask if he does cognitive therapy, as you are looking for a provider who can address memory problems. He may answer that question affirmatively, yet actually be referring to the cognitive-behavioral approach he uses in his counseling sessions.

METHODS OF COGNITIVE REHABILITATION

One of the reasons special education teachers can so effectively enter the cognitive rehabilitation field is due to their rigorous training in teaching methods and strategies. They are already apprised of both curriculum development and the wide variety of methods used in assisting the learning of new information. This information can easily be transferred to the relearning of old information. There are many proposed methods, however, listed below are those that are most applicable to the head injury population.

Deficit Specific

In deficit specific, the therapists identify a specific area such as "moderate impairment in visual discrimination." Therapeutic efforts concentrate on teaching (reteaching) clients to compare visual materials and determine similarities and differences. The identified area of weakness (visual) becomes

the subject of retraining.

Multisensory

A multitude of cognitive processing pathways are utilized to assist clients with visual deficits. They might be asked to verbally describe (auditory channel) the stimuli until they can tell the therapist the difference between two figures. In addition, they are asked to draw both figures or trace over both to tactually (kinesthetically) process the differences. This multisensory approach uses all the client's learning channels.

Compensatory Methodology

Another useful method requires careful observation of client performance. Then the therapist carefully analyzes the problem areas and provides the clients with compensatory strategies. Using the "visual discrimination" deficit, the clients may need to increase attention, develop self-monitoring skills, and be willing to recheck themselves anytime visual material is presented. Ultimately, this method is the most universally effective, particularly in efforts to generalize to the real world.

There are also numerous strategies used in the area of cognitive rehabilitation therapy. A few of the most common are listed below.

Overlearning

This strategy is used with clients who have problems encoding (taking in) information but who appear able to retain adequately when repetition is used. In this way the individual can eventually learn a task and perform it automatically when required. The therapist provides learning activities involving one particular concept until a specific criterion is obtained.

Cuing

Evaluations may reveal that clients can encode efficiently but appears to have difficulty with retrieving the information. The therapist can provide cues to assist the clients in pulling the already learned information from the storage system. Once these cues are developed, family members, prospective employers, and significant others can be instructed in these assisting devices. Efforts should also be made to reduce these cues to a minimum level necessary for the clients to function in the community.

Handling Interference

Many persons with head injury can, through individual cognitive therapy, learn to perform at an acceptable level in numerous activities. However, if the

therapist does not control for, and/or modify, the interference levels, the clients will be ill prepared for the real world. This interference, whether visual, auditory or a time lag basis, should be measured at baseline level. Therapy can then consistently train persons with head injury to handle greater amounts of interference.

Self-Management

People with head injury should be taught in cognitive rehabilitation therapy to monitor their progress by recording their successes and to plan efforts to improve their production. This is one of the highest level strategies, one that when successfully applied allows the person with head injury to avoid some of the ultimate pitfalls on the job. This system is initially set up in reference to the cognitive therapy goals, but is ultimately adopted for use in work adjustment training (WAT), skills training, job coaching, or actual job placement. For example, it might be noted in therapy that clients have difficulty with excessive verbalization. The therapist would assist such clients in monitoring this within the therapy setting. These skills might later be transferred to the actual job setting with the clients asking either the boss or fellow colleague to evaluate the self-management system of reducing excessive talking.

DESCRIPTION OF A COGNITIVE REHABILITATION SYSTEM

The previous definitions and explanations presented the complexity of the field of cognitive rehabilitation. Over the years professionals who have followed individuals from the acute rehabilitation stage (just barely out of coma) to community reintegration have discovered that this type of intervention is much broader than was originally thought, and that there are cognitive activities appropriate for all phases of head injury rehabilitation.

Calub, DeBoskey, Burton, and Hooker (1989), described a matrix in a recent publication that helps to pictorially present the comprehensive nature of this field, as well as its applicability to all stages of head injury recovery.

Across the top are the modules of evaluation, treatment, and generalization. Each of these modules is carried out for all the cognitive rehabilitation areas of cognition, behavior, psychosocial, and educational/vocational. In addition, the stages of cognitive rehabilitation are broken down with three phases as described by Klender (1984), in an adaptation of cognitive approaches from the Ranchos Scale (see appendix for scales). The cube represents 36 separate blocks. As you can see, a few of these blocks are somewhat irrelevant. For example, there would be little effort made in the treatment or generalization modules for Phase I clients in relation to the vocational area. In fact, vocational counselors would have little to no contact with clients who fall in Phase I (Ranchos Level 1, 2, and 3).

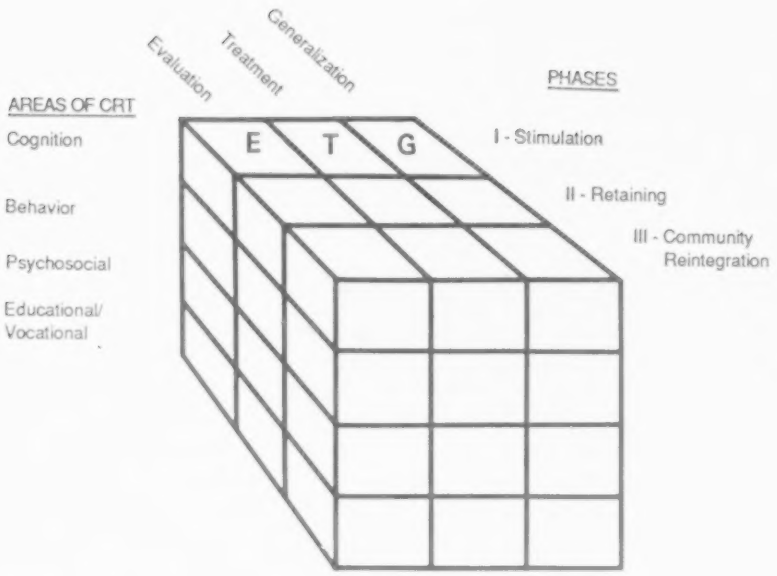

Figure 1. Modules

Questions About Cognitive Rehabilitation

The field of cognitive treatments is evolving and confusing. As a result, the vocational rehabilitation counselor and consumer should ask specific questions of providers. You need to know what you are purchasing, the results expected, the methods used, how long might it take, and how does it relate to the overall plan.

How do you know if your client needs cognitive rehabilitation? The evaluation module would provide answers to this question via the neuropsychological, vocational, work evaluation, and possibly speech/language assessments. You will want to make sure that all four areas in the Figure have been addressed before you make a final determination. Going back to the case of Melody, we find that the area of cognition showed only mild impairment and would not have warranted a recommendation for treatment. However, further evaluation of behavior and psychosocial skills during the work evaluation revealed the need for psychosocial skills training in order to address behaviors that would interfere with her effectively holding a job. If she had continued to remain disorganized and display lack of initiative, the difficulty she displayed in staying in a job for any significant length of time would have continued.

Who is qualified to provide cognitive rehabilitation? There are no specific licensure requirements beyond those required of the individual rehabilitation professionals providing the treatment. Therapists who have typically provided these services are psychologists, neuropsychologists, speech/language pathologists, occupational therapists, and special education teachers. Beyond the basic licensure issue, the most important prerequisite is rehabilitation experience with persons with head injury. This experience should include the following of clients over at least a one to two year time frame, and, hopefully, experience with more long-term cases of five or more years postinjury. This is important because short-term therapy in an acute rehabilitation facility does not provide the therapist with exposure to all the complications that arise when clients attempt to return to the community. Do not be reluctant to ask proposed vendors about their experience with long-term follow-up. You might also ask for the names of past patients or families who would be willing to provide you with feedback about their cognitive rehabilitation program.

The second critical factor would be the provision of an individualized treatment plan. Ask providers for a copy of their Cognitive Rehabilitation Treatment Plan. If they say they cannot provide this because all plans are individualized, be leery of this vendor. Of course, a plan is written on an individual basis, but those who provide CRT in a systemized fashion with the ability for appropriate evaluation of your client's progress should have a plan that is used to record data and monitor progress. Ask them to provide this information. If they cannot or do not, consider another provider.

When should cognitive rehabilitation therapy begin? There is a need to answer this question from two perspectives. The first perspective is the issue of "quality of life," regardless of whether the clients will ever go back into the work force. With this in mind, many rehabilitation professionals believe that therapeutic efforts should begin as soon as the person goes from Level 1 to Level 2 of the Rancho Los Amigos Scale (see appendix for scales). In Figure 1, you will note that Phase I provides stimulation to people with head injury who are just out of coma. On the other hand, there are some who support providing physical therapy (PT) and occupational therapy (OT) at this time, but who are not in favor of stimulation activities offered by cognitive therapists. This perspective is not usually an issue for the vocational rehabilitation counselor, except to note in a prospective client's medical records the availability of this therapy at the time of hospitalization.

The second perspective involves clients in Phase II or III of Figure 1. There are varying views of the level at which vocational rehabilitation counselors should consider providing services to clients. One of the issues involved in these diverse outlooks is the question of "spontaneous recovery," or the period of time when the brain is mending on its own. Some propose that,

while clients are in this recovery stage, cognitive therapy will not hurt, but it also will not provide anything beyond this natural progress that is already taking place. Others believe that the additional assistance of cognitive therapy can both expedite the recovery and prevent faulty "reconnections." Unfortunately, both perspectives are theoretical at this time.

There is really no set time that can be proposed for starting cognitive therapy. Some state rehabilitation offices have stated that clients have to be at least six months postinjury. It makes some sense to say that VR counselors should possibly wait that time or longer, since an individual may effectively recover with little need for assistance. In addition, one may need that time, and possibly longer, to determine if individuals are feasible vocational candidates. However, these time constraints are directed at the needs of counselors - not head injured individuals. Thus, the most humanistic answer is that cognitive therapy should begin just out of coma. The answer that addresses the issue of when you should authorize cognitive therapy should be based on the results of your analysis of the feasibility issue. Once you have determined (using the various evaluations described in previous chapters) that some degree of vocational re-integration is possible, then therapies should begin.

What are feasible and/or legitimate duration and intensity time frames? There is a great deal of variance here, depending upon: the acuteness and severity of the injury; various premorbid personality and vocational factors; and the presence of support systems in the clients' environments. In addition, the amount of therapeutic intervention needed to get the head injured persons back into the community will depend upon the amount and quality of previous therapy.

In general, 4 to 15 hours of cognitive therapy sessions are recommended per week. The more intensive the treatment, and the more the goals are integrated with the real world, the shorter the treatment. You should approach with caution therapists who say that cognitive therapy one hour per week can assist in providing the gamut of skills (cognitive, behavioral, psychosocial, and educational/vocational) set forth in Figure 1. One hour a week is a psychotherapy schedule - not a cognitive therapy schedule. Only after a much more comprehensive program would it be feasible to finally reduce clients to one hour a week of "maintenance" cognitive therapy. Vocational rehabilitation counselors will need to approve additional units of therapy with appropriate authorizations, based on documentation of progress. Such documentation is provided through monthly reports indicating the status of the clients in reference to the cognitive therapy treatment plans. These plans should include efforts to get your clients ready for the next steps of your vocational plans.

Depending upon the potential of the clients and the intensity of the programs, the length of cognitive therapy can vary from one month to two years

when looking at the average of general cases across the board. For vocational rehabilitation cases that are longer standing, a three to six month duration might be expected.

How will you know what progress has taken place? It is the therapist's responsibility to provide you with a treatment plan that will completely delineate the goals that are being addressed, as well as the progress that is being made. If after two months of therapy (at least six hours per week) no progress has been measured, you will need to re-evaluate your vocational plan. You may want to authorize a cognitive re-evaluation after six months. These time frames are provided as a general rule of thumb, keeping in mind that each client with head injury will have varying needs.

What if there is no designated cognitive therapist in the rehabilitation program of your choice? It is not absolutely necessary that cognitive rehabilitation therapy be provided by a single person who is designated a "cognitive rehabilitation therapist." In some rehabilitation facilities, all of the individual therapies (physical therapy, occupational therapy, speech/language therapy, and psychology) provide activities to address the cognitive deficits. They will say, "We all do cognitive therapy." Then it will be necessary for you to determine if they have an organized approach to their procedure of cognitive rehabilitation.

The most efficient method, as well as the most comprehensive, includes a separate cognitive rehabilitation treatment plan whereby each therapist provides input to the plan. In this way you can be fairly sure the team is working together to provide an interdisciplinary effort. If the therapists indicate they each have sections in their individual treatment plans, then you will want to ask the team leader to explain to you how this offers an effective cognitive program. If the response seems unsatisfactory and you have other options, you may want to look elsewhere for services.

What outcomes can be expected from cognitive rehabilitation therapy? Cognitive rehabilitation therapy improves the efficiency of the person with head injury - it does <u>not</u> cure head injury. If therapists tell you they are attempting to eliminate memory deficits, you should be somewhat leery. The overall goal should be to assist the head injury individuals to compensate for and manage the remaining weaknesses.

Studies to document the efficacy of cognitive rehabilitation are few in number. This should not necessarily be taken to mean that its worth is in question, but rather is a statement about the difficulty in providing "clean" research in this area. Prigatano, Fordyce, and Zeiner (1984) provided one of the first studies to rigorously evaluate a cognitive rehabilitation program. Others were performed by Yehuda Ben-Yishay and David Sena. Additional studies are

needed before the effectiveness of specific techniques are proven or disproven. Currently, it is necessary to use clinical documentation that changes do take place as a result of this type of intervention as proof of effectiveness.

What materials are used in cognitive rehabilitation therapy? When this field was in its infancy, therapists pulled from many areas of special education, speech/language therapy, children's brain teaser puzzles, etc. Now there are numerous therapeutic activity books and manipulative material that have been developed in all of the rehabilitation areas. There are even some comprehensive packaged systems, such as REHABIT (Reitan & Wolfson 1988), that provide systematized treatment modules and materials to treat each deficit area. A list of possible materials will not be provided here. However, further information can be found in the articles offered in the journal Cognitive Rehabilitation published by Neuroscience Press in Indianapolis, Indiana. What is more important than the materials are the people who use them. It is actually the insight, expertise, and experience of the therapists that make cognitive rehabilitation therapy effective.

What is the place of computers in cognitive rehabilitation? The use of computers has been a controversial issue in the field. Most rehabilitation professionals believe there is a place for this tool, but they do not feel it should be used as the only or primary therapeutic method or strategy. There has been a proliferation of cognitive rehabilitation software in the past five years. Many of these programs are excellent if used in an appropriate fashion.

Computers do not do cognitive rehabilitation. They are an extremely efficient tool with which to meet some of the treatment goals, particularly in the retraining phase. However, a thoroughly trained or supervised professional should be with your client while using the computer at least 50-75 percent of the time. Programs relying primarily upon computer-based techniques, without professional one-on-one involvement, will lead to very limited generalization to real life and, hence, result in limited vocational outcome.

The computer is most effectively used as one of many tools in the rehabilitation program. If the clients have a home computer or can afford to purchase one, it is an excellent method of extending therapeutic time. Therapist can guide clients in choosing programs that will enhance therapy.

DELIVERY OF OTHER THERAPEUTIC SERVICES

Individual Therapy

The individual therapist works one-on-one with the client. This is the most effective approach when persons with head injury are still in the retraining phase. However, it does not allow for effective rehabilitation for the behavioral

or psychosocial issues that can occur in a job setting.

Group Therapy

This therapy is effective when clients are ready to work on job-related social skills. The group setting is the only way to obtain generalization to the real world. This is particularly effective once the group members have gotten to know each other and feel comfortable enough to say what they are thinking (although this is not usually a difficult task for persons with head injury!). For example, when the individual therapists try to tell clients that they should not interrupt others, the impact is at times not as great as when a group of peers offer that same recommendation.

Comprehensive Day Treatment

If available and/or affordable, comprehensive day treatment is often the most efficient service in returning persons with head injury to the work environment. If operated from a holistic standpoint, it offers a minitherapeutic community whereby a group of people with head injury can be provided with training in all four areas of cognitive rehabilitation (see Figure 1).

Yehuda Ben-Yishay began the head trauma day treatment program at New York University that has been used as a model by Prigatano (1984) and many others across the nation. Most programs offer anywhere from 10-26 hours of therapy per week. Groups typically range in size from six to 12 depending upon individual staffing. Programs are often run by psychologists or rehabilitation counselors and social workers with input from other rehabilitation areas. Some programs are set for four to five days per week. Others have the flexibility to reduce to two days a week, which can allow for continued treatment while clients look for a job, work part-time, or become involved in additional training activities.

A typical day may include a schedule something like the one presented below:

8:45 - 9:30	Team professional meeting
9:30 - 10:00	Orientation
10:00 - 10:30	Individual or small group cognitive therapy
10:30 - 12:00	Psychosocial group
12:00 - 1:00	Lunch with peers
1:00 - 1:45	Personal counseling
1:45 - 2:30	Group cognitive
2:30 - 3:00	Community
3:00 - 4:00	Client-family group

Other Psychological Services

Individual counseling is often necessary in order to help persons with head injury to accept deficits and be willing to work for success at a different level. Once this acceptance arrives, counseling may still be needed to assist clients in combating the depression and/or anxiety that follows a realization of their particular condition.

A psychodynamic (Freudian) approach to therapy is not generally effective as adjustment issues are usually related to head injury and not personality development. Either cognitive-behavioral or behavior management would be the most practical therapeutic intervention. People with head injury must have a very structured and goal oriented approach. This service should be provided by an experienced counselors or psychologists who are also familiar with the typical problem experienced by persons with traumatic brain injury.

Family counseling helps family members become or continue as the client's primary support system. Family members need help dealing with their denial, overoptimism, anxiety, depression, fatigue, loss of social contacts, and family strain. When a client is living at home it is always a good idea to include the family in your rehabilitation plan for the client. If they are not in agreement with your goals and feel that their loved one has greater vocational potential, they can either consciously or unconsciously sabotage realistic plans. It is helpful to remember that persons with head injury often go back to being quite dependent on their family. For example, a head injured twenty year old would probably be much more influenced by parents who were saying, "You can still go to engineering school" than by a counselor who recommends small motor repair. Remember, the family is often the key to the rehabilitation of a person with head injury.

Psychosocial counseling is best described as an area of comprehensive cognitive rehabilitation therapy. After head injury, persons find themselves thinking, feeling, and acting in ways that are different from how they thought, felt, and acted before the injury. The numerous cognitive and behavioral problems can create another set of difficulties called psychosocial problems - problems adjusting to everyday living. These may consist of a sense of being "different," strained family relationships, loss of friends and difficulty making new ones, problems returning to school or work, and loss of career. Therapy should be geared toward recognition of these issues, as well as the effective means of accepting and modifying life's circumstances. As with the individual counseling, it is imperative that therapists have experience in long-term head injury rehabilitation.

SKILL TRAINING

In preparing individuals with traumatic brain injury for employment, their

knowledge, skills, abilities, work and production behaviors are assessed prior to beginning the placement process. While many of their strengths, aptitudes and deficits have been identified, and a degree of remediation achieved, further skills training may be necessary to make them more employable at their current functional level in the local labor market.

One of the outcomes of a vocational evaluation covered in an earlier section of this book is the recommendation for skill development and training. The skills training opportunities for persons with traumatic brain injuries are developed in ways similar to developing training options for other vocational rehabilitation clients. The key difference with securing appropriate training services is that the vendors are both sensitive to, and familiar with, the unique needs of the individual clients that are referred to them for training. It is also important that vendors be willing to work with persons with traumatic brain injury and the vocational rehabilitation counselor to insure that they receive the full benefit of the skill training experience. This will serve to enhance their overall employability.

The role of involved vocational rehabilitation counselors may include working with various skill training vendors to increase their knowledge of the implications of traumatic brain injury through a disability awareness program. This would include discussion of how functional deficits may impact on the training and what strategies might be employed to minimize their impact. Memory aids, similar to those used on the job, (such as notebooks, structured task sheets, etc.) may be used in the training program to insure maximum benefit. Arrangements for tutorial and review sessions may be made with vendors as part of the program services purchased, along with more frequent progress/performance reviews.

Vocational rehabilitation counselors should plan to have frequent contact with this type of client to review progress, support performance and to provide guidance and counseling. Close involvement between persons with traumatic brain injury, vocational rehabilitation counselors, and vendors will allow for necessary adjustment and modifications of the training schedule. Such training schedules need to be responsive to the unique needs of each client.

EDUCATION

Education or retraining is often necessary in order to help people with disabilities acquire skills that are usable in the job market. Typically, an intellectual and academic evaluation is required in order to determine the client's capability to handle further schooling. However, with the head injured persons, an intellectual/academic evaluation can be deceiving. These are primarily measurements of old learning and do not necessarily represent the person's ability to learn and assimilate new information.

Intellectual scores in the 70s or 80s typically indicate that further academic training would not be the best way to get these people employable. On the other hand, average or above IQ scores suggest the ability to proceed with some type of education. However, counselors must not assume that people with head injuries will function on this average or above average level in the courses. It is often helpful for them to have reduced academic loads initially, as well as to have received some cognitive rehabilitation in the educational area as shown in Figure 1. Therapists here would provide clients with compensation techniques based on their areas of weakness. These include such things as recording lectures, attending two sessions of the same class, outlining taped lectures, recording notes into a tape recorder, keeping an organized plan of what should be accomplished each day, and encouraging involvement with peer study groups.

Some schools have special services for learning disabled students. If needed, obtain the help of these services so the head injured clients can take tests orally, type a test, have longer to finish than the other students, or go to a special area free of distraction to complete a test or assignment.

Some persons with head injury are capable of further education, and they should be given the opportunity. It is important for vocational rehabilitation counselors to be aware of the pitfalls ahead of time so that the appropriate conditions can be set forth for success.

SUMMARY

As you can see, there are many treatment options that may precede the vocational placement of individuals with head injury. We have attempted to explore the gamut of services available; however, many of these may not be readily available in your community or within a reasonable traveling distance for your clients. In addition to these more innovative treatments, you may need to purchase some of the traditional rehabilitative services described in an earlier chapter, such as physical therapy, occupational therapy, speech/language therapy or various medical services.

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Chapter 9

PLACEMENT OPTIONS AND PROCESSES

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INTRODUCTION

Work is one of the most important single activities that is a routine part of our adult lives. Often a great deal of time is spent preparing for a particular type of work through a combination of education, training, and experience. In addition to providing varying degrees of economic independence, a job or career provides an important component of our identity. When questioned as to who they are or what they do, people tend to reply in the context of their vocational identity.

In many of the cases of persons with traumatic brain injury, there are certain residual conditions that are directly attributable to the injury which may prevent them from returning to the type of job held, or career pursued prior to their injury. If a person cannot do the task the old way and cannot learn new ways to perform the task, it then becomes necessary to transfer residual skills to a new occupation (Long, Gouvier & Cole, 1984). Many clients with traumatic brain injury can work, but must explore new vocational directions and options.

Vocational counseling, training or retraining, coupled with a wide range of vocational opportunities are critical to the rehabilitation of the person with traumatic brain injury. However, vocational rehabilitation services are usually one of the last services considered for persons with traumatic brain injury. Unfortunately, the same delay in development has occurred in the vocational rehabilitation procedures and service protocols. While not as developed as some other services required by persons with TBI, there are procedures and service protocols which have proven useful. As a professional discipline, vocational rehabilitation is continuing the development of options to deal with the unique, complex, and dynamic aspects of traumatic brain injury and it's vocational implications.

Any program concerned with the placement and employment of a person with traumatic brain injury should be individualized, structured, and consistent. Consequently, the placement staff should have a good understanding of the nature of traumatic brain injury and it's broad implications for work and reintegration into the community. The program must be flexible and capable of being modified based on new information about performance. Further the program should consider how cognitive deficits impact on the placement process and what new placement strategies need to be implemented to compensate for these deficits. The return to work should not be an "all or none" proposition. Rather, it will continue the pattern of graded resumption of activities which were begun early in recovery and continued throughout the rehabilitation program (Long, Gouvier & Cole, 1984).

WORKING WITH THE CLIENT

The involved vocational professionals must remember that traditional approaches to rehabilitation and placement will have to be modified to meet the special needs of the person with traumatic brain injury. There may be problems that are organically based. For example, deficits in executive functions may cause difficulty in planning, priority setting, initiating and follow through. These clients will need considerable assistance in maintaining the goal directed behaviors associated with job search and placement. Because these job search behaviors may be compromised, new placement strategies should be developed and implemented to compensate for these deficits. Corthell & Tooman (1985), suggested that for persons with traumatic brain injuries, traditional approaches will not have the same effectiveness as with a cognitively intact person. They caution that "...traditional job training programs are often ineffective with traumatically brain injured clients, because it is not the absence of skills, but the failure to apply those skills in a consistent, flexible, self-monitoring manner that usually stand in the way of successful job placement" (p. 93).

Blankenship (1988), notes "...that the goal of the vocational rehabilitation specialist is to maximize the individual's postaccident vocational development. Whenever possible, the individual would be integrated into the work force in the most compatible job which would allow for the realization of the greatest earning capacity" (p. 40). If information generated by various evaluations and reports indicate that a return to employment is not feasible at the time, then the role of the vocational rehabilitation specialist is to enhance the quality of life and ensure the long-term care that will maximize the individual's developmental potential.

Career Counseling

Career counseling is necessary to develop job goals that are realistic in light of retained skills, knowledge and functional abilities, residual impairments, and the needs and requirements of the employment position that is under consideration. In many cases, because of the relatively young age at time of injury, persons with traumatic brain injuries might not have had the opportunity to develop an extensive pre-accident employment history and have little "real" work experience upon which to build a realistic career plan. An effective approach is to work with all involved to develop a series of intermediate job goals that will allow the person with traumatic brain injury to develop a career track rather than a series of jobs. These goals may involve such steps as volunteer placements, job tryouts, further education or skills training, or entry level employment. The development of intermediate job goals allows for modification of the goal planning process in light of new information contained in reports on behaviors and performance in the community.

Another group of individuals seeking career counseling after a traumatic

brain injury is the older client. These individuals usually have more work experience and have developed a stronger vocational identity. They may want to return to either a specific job and employer or a similar job to the one they held prior to the injury. If testing indicates there are adequate residual knowledge, skills, and abilities to perform in that capacity, then the role of the rehabilitation professional is to arrange the requisite degree of support to allow for successful vocational reintegration. If the person cannot return to this former position, then significant vocational/ job placement counseling and guidance may be necessary and reinforced through family members.

The placement professional should examine all appropriate reports that might provide useful information for preparing a useful placement plan. The plan will include the development of placement strategies that are responsive to the unique needs of the individual with traumatic brain injury. Prior to writing the plan, the placement specialist will take a thorough vocational history (both premorbid and postinjury), and develop an employment fact sheet. As part of the placement assessment, skills in job seeking and keeping need to be explored. For example, can the individual find appropriate job openings, fill out employment applications correctly, prepare a resume, and conduct themselves appropriately in an interview? If not, would job seeking skills or job keeping skills training programs be helpful?

In development of diagnostic information, one might use a published tool like, "The Vocational Adaptivity Scale (VAS)" (Thomas, 1988). The VAS has proven helpful as a tool in collecting information about a person's ability to identify job goals, search for employment, and exhibit adequate vocational and social adaptive behaviors necessary to keep a job (Thomas, 1988). "This instrument contains the forms for collecting data from a variety of sources and a Composite Profile for posting data. In addition, the VAS also describes specific procedures for use with the data collection protocols. The VAS contains a total of four protocols which examine: (a) Job Search Strategies; (b) Telephone Inquiry Skills; (c) Personal Interview Skills; and (d) Work Supervisor's Ratings" (Thomas, p. 1).

Job Preparation

The placement professionals can offer assistance and guidance to the person with traumatic brain injury in their preparation for the job interview by doing such things as viewing training tapes on interviewing and videotaping practice job interviews. Rehearsing interviews on videotape, reviewing them, and practicing suggested responses to potential job interview inquires are all important steps in preparing for job seeking for many people with disabilities. However, for persons with traumatic brain injury it is doubly important to rehearse their waiting room behavior, initial introduction to the interviewer, and appropriate responses to questions.

The placement counselor can also assist the person with traumatic brain injury to develop a script for making telephone contacts with potential employers. That script might list important questions for the client to ask such as: a description of the job openings; salary range and benefits; location; whether an interview can be scheduled; or preference for review of a resume as the first step in the employer's application process. Like the practice interview, the use of the telephone script can be rehearsed and reviewed in the controlled setting of the rehabilitation program offices prior to actual application of these skills.

Selective job placement and the self-directed job search are traditional placement methods that allow for wide degrees of client involvement, initiative, and participation. However, special considerations are necessary when working to place a person with traumatic brain injury in an employment setting. Corthell and Tooman (1985) discuss some special considerations that caution:

> The self directed job search by the traumatically brain injured client may be difficult. Planning, carrying out and monitoring one's own job search requires an individual with intact executive functions. The counselor, or placement specialist will generally be required to develop a job for the traumatically brain injury client. Should this be the case, there may need to be a pre-existing relationship between the employer and the rehabilitation agency...the employer should be appraised of the behaviors and learning style of the individual. Additionally, the employer should receive or be offered an array of services that could aid the client in becoming a productive an profitable employee (p. 95).

In a discussion of the placement process for persons with traumatic brain injury, Wehman, Kreutzer, Wood, Morton & Sherron (1988) identified several major aspects of the process which included: (a) matching job needs to client abilities or potential; (b) facilitating employer communication with the client; (c) facilitating parent or caretaker communication; (d) establishing travel arrangements or providing travel training; and (e) analyzing the job environment to verify all potential obstacles which may arise (p. 302).

The job analysis of potential positions will assess various elements, skills, aptitudes, and other requirements of the job. However, with the person with traumatic brain injury more detailed information is often required. For example, the placement specialist needs to assess: the level of supervision available and the degree of independent functioning required; interpersonal requirements of the job including the involvement with co-workers and with the public; and the stresses and pressures as generated by production expectations. The level of responsibility required by the position, the attentional levels, and the level of stimulation must also be considered. The opportunities to modify or restructure the job or the work environment are important aspects of the job environment to be explored. Job skill requirements are scrutinized to determine if retained

skills, learning abilities and cognitive issues will allow the person with traumatic brain injury to function adequately in the position.

Maintaining Momentum

The anxieties, disappointments, hope and excitement that accompany the job search can be an exhausting emotional roller coaster. It is important to maintain a positive attitude and a high level of enthusiasm during the placement process. Once the client begins the job search, contact with professionals and peers in similar situations will provide the support necessary to maintain the requisite levels of enthusiasm and energy. Vocational rehabilitation counselors, job coaches, and therapists can use their routine contact with the person with traumatic brain injury to help them throughout the job search. Job clubs can also be used to provide peer support to accomplish the same ends. The maintenance of energy, enthusiasm and momentum are crucial to a successful outcome.

WORKING WITH THE FAMILY

The concern of family and significant others must be acknowledged and addressed during exploration of potential job placements. Nice (1984) states that "involving the family in the rehabilitation of the head-injured family member is becoming more and more prevalent in the provision of rehabilitation services. Rehabilitation efforts increase in their effectiveness when the natural support group - the family - is involved as an integral part of the process" (p. 1). Their concerns and needs should be considered to make sure that their expectations and goals are realistic and consistent with those of the client and the involved rehabilitation professional. They are a valuable resource, motivator, and information source.

Frequent meetings with the person with traumatic brain injury, family members, and involved rehabilitation staff (counselors, evaluators and placement personnel) should take place on a routine basis. Initially, these meetings should focus on goal planning realistic in light of the client's residual knowledge, skills, abilities, capacities to acquire new skills, and the resources of the community. Additional meetings should focus on progress and goal modification based on the review and evaluation of performance as viewed by the client, the family, and the involved professionals. Once the person with traumatic brain injury is placed in a paid or unpaid work position, these meetings should continue on a routine basis to discuss information generated through the follow-up process. The discussions should expand the plan to add specific long-range planning such as career paths, housing, avocational pursuits, socialization, and any other directions that might serve to maximize the level of the client's independence.

WORKING WITH THE EMPLOYER

One of the most important keys to the successful placement and job maintenance of a person with traumatic brain injury is the understanding and flexibility of the employer and/or the immediate supervisor. In almost all vocational rehabilitation cases, the employer will not be someone who has previously employed this individual. There are some positive aspects to this as the employer will not have any expectations based on knowledge of the client's former skills and will not be focusing on any deficits that now exist. On the negative side, the employer will not have a vested interest in the individual so that any special allowances that an employer may make for a former employee will be absent.

In general, it can be assumed that most prospective employers will know very little about head injury, the residual cognitive deficits, and the behavioral difficulties that may exist. It is important that they receive enough information so that the client is not immediately "let go" the second day of work for an infraction that might have been anticipated. On the other hand, too much information can lead the employer to think, "Why in the world would I want to knowingly hire someone with these types of problems?" DeBoskey, Oleston, Dunse & Morin (1986) wrote a manual with the original intention of providing a prospective employer with a wealth of information on what to do in reference to most of the problems that could occur. Subsequently, the authors realized that handing a book called "Hiring the Head Injured: What to Expect" to an employer was like handing them a manual entitled "One Hundred and One Reasons You Should Not Hire The Head Injured." Instead, a revised manual now instructs counselors on how to verbally share pertinent information with the employer. The concept of educating people on the job site regarding what to expect and how to deal with behaviors remains as paramount as finding a willing employer.

Education of the Employer: Meeting Placement Needs

Educating employers will be up to the counselor who will rely heavily upon the findings of all assessments and therapeutic interventions. The potential for cognitive and behavioral problems on the job must be delineated, and the counselor will offer suggestions for structuring the job so as to minimize these difficulties. If the client has been involved in a work adjustment training program, a psychosocial group, or a supported employment setting, the information obtained from these training environments will help the counselor to trouble shoot possible problem areas. If professionals are aware of potential problem areas, but are not sure how to translate this information to the new job setting, ask the evaluators or direct service staff for clarification and input. Their suggestions may help to avoid those surprises on the job that employers find so distasteful.

Case study. The case study of John presented in the previous chapter will be used as an illustration of how to prepare an employer. John was an injured carpenter who had trouble maintaining a carpentry job after his injury. Although the initial evaluation uncovered an auditory memory (encoding) problem, further evaluation in work adjustment training (WAT) revealed difficulties with distractibility, disorganization, irritability, physical outbursts, and egocentrism. The cognitive rehabilitation sessions had concentrated on the auditory memory, distractibility, and disorganization problems. Follow-up psychosocial groups had addressed his tendency toward irritability, anger control, and self-centered orientation.

The vocational rehabilitation counselor was aware of the progress John had made in all these areas, as well as the deficiencies that still existed. One of the greatest potential problems with John was that he had no residual physical problems and thus looked completely "uninjured" to his past employers. The counselor had contacted three past bosses and they all presented a fairly consistent view of John "He just didn't want to work. He came to work unprepared and was easily set off by anything that was said." In addition, they all insisted that they did not think he was injured, "He looked fine to me - just acted bad." In this situation, it is important for the counselor to provide some basic information about head injury in language they can understand. It would be important for a future employer to understand that John is not basically a "grouchy" guy who does not want to work. Instead, the counselor might say "damage to his brain has shortened his fuse and has made it difficult for him to follow oral directions and effectively organize his work. His ability to visualize is intact and he understands visual things like sketches and blueprints." Thus you have described temporal and frontal lobe problems and indicated that they should concentrate on his intact parietal and occipital lobe functions. Because a boss sees that John can produce an excellent quality cabinet, they think he is loafing when he does not meet production (quantity) standards.

The counselor sets the stage by giving a simple, but truthful, explanation of what may appear to be deliberate inappropriate behavior. Then the counselor should go on to provide the employer with ideas for managing John's potential problems.

Distractibility. The counselor would explain to the new employer that John performs best when he is free of outside distractions. He should be in an isolated area when possible and should be asked to accomplish tasks one at a time, rather than trying to think about a new job while he is finishing up another one.

Disorganization. The client has great difficulty getting organized to start a new task. He misplaces his tools and is constantly borrowing from others. Problems arise when he does not return borrowed items or he forgets that he

ever borrowed them. It would be important for the job site supervisor to maintain a watch over John's work space. Someone should be assigned to monitor the organization and inventory of his tools. This disorganized approach leads to lowered production as he spends excessive time "getting ready to do" rather than "doing." Another alternative, in John's case, may be to place him as a shop carpenter where tool outlines are on a pegboard. Utilizing his visual skills, he could be trained to return all tools to the silhouette of the tool on the pegboard.

Irritability. Most of John's fellow workers in the work adjustment training program found him as grouchy and irritable. One particularly insightful colleague began to realize that his mood was consistently related to the frustration he felt by not being able to produce at his pre-injury rate. Although he produced an excellent product, it did not usually meet his preconceived standards. John's new employer, and possibly even potential fellow workers, should be aware that his general mood is primarily a problem of self-esteem and confidence rather than a dislike of other people. If this can be overlooked and not lead to negative reactions, then the social setting can start off on a positive note. Appropriate instructions to co-workers and supervisors would be to give verbal praise and/or a smile for quality work. If John denies the praise, the person offering the praise was told to walk away and not listen to negative talk.

Physical outbursts. Although John had never physically hurt anyone, he had smashed carpentry work he was attempting to assemble. In most job settings this would be unacceptable and could result in immediate termination. Therapy had quite successfully focused on redirecting his anger away from self-doubts and accepting his limitations. However, it was possible that in a new and stressful situation he could explode. The counselor explained John's history to his new boss and related how these outbursts were associated with lack of control. It was agreed that he would be given more than one chance as long as this behavior did not become a habit. In addition, they were instructed to contact the vocational rehabilitation counselor if any of this behavior occurs so that they could intervene to "nip this behavior in the bud."

Egocentrism. This client has been described by others as "only interested in himself." Again, therapeutic intervention revealed that this self-centered behavior occurred primarily when he was worried about "producing" on the job. It is easy to be helpful to others when things are going smoothly, but this had not been the situation for John since the accident. The prospective employer was warned not to entirely focus on making exceptions for John's disabilities. We wanted him aware of the possibilities, but did not want him feeding into the potential of continual demands from John.

Interviewing Techniques

The process of presenting oneself in a positive manner during an interview is an asset needed by all job applicants, but it is paramount for the person with a traumatic brain injury. If employers have not had experience with other traumatic brain injured employees, they may expect or anticipate responses that will provide them with reasons not to hire. If the first impression is positive, it is likely the client will be given the chance to prove themselves.

These interviewing skills would be covered in individual cognitive, psychosocial, or job seeking skills training. John had extensive intervention in his group treatment based on the role playing of interviews. He was holding on to the thought that he did not have to impress the employer because his "craft" spoke for itself. This had been the case prior to his injury but was no longer true. John was helped to accept this fact and learned to "sell himself" rather than expecting that an employer would be lucky to get him!

Working with the Array of Placement Opportunities

Because of the unique and dynamic aspects of traumatic brain injury, placement opportunities and options should be structured in terms of an array of services rather than as a service continuum. Persons with traumatic brain injury can move among the array of placement options based on their current state of functional abilities and service needs. Employment opportunities must be viewed as which category is the least restrictive at the current point in time. Because progress can be viewed as the process where gains and losses go hand in hand, an array of services allows for the design of a flexible, responsive vocational placement plan which takes into account the varying needs of the person with traumatic brain injury at different points in time postinjury.

A service delivery system may have services available as part of an array which include, but not be limited to the following: facility placement, volunteer work, supported employment, job seeking skills training, ongoing job club (support group).

Facility placement. As with any vocational rehabilitation or placement program, the most effective programs are those designed to be free-standing to specifically and exclusively serve those persons with traumatic brain injury. The next most desirable option of available services would be found in programs or facilities that serve this population in separate in-house programs.

One of the least desirable and effective ways of serving the person with traumatic brain injury is placing them in facilities or programs that are designed to serve other disability groups such as mental health or mental retardation.

One placement setting, utilized for persons with traumatic brain injury, is a noncompetitive one usually found at a work activity center or at a sheltered workshop. This setting is useful as a placement for the more severely disabled traumatically brain injured client and can be used as a transitional setting to work on modification/improvement of work capacities and work hardening issues. Work activity or sheltered workshops tend to have higher staff to client ratios than are found in other settings. The more favorable staffing pattern can allow for behavioral interventions where conduct problems impact adversely on vocational potential. Thus the staff pattern allows for active intervention to help the client control or modify nonfunctional behaviors.

Volunteer placement. Volunteer placements provide transitional opportunities to test a variety of work and production behaviors in a community based setting. It can also serve as a forum for the person with traumatic brain injury to conduct more extensive career exploration and test behaviors in a different setting. Schmidt (1984) talks about a vocational experience "...outside of the program and within the community. This experience purposefully reduces the structure within the ...program, and promotes adaptation to a new, less structured work environment" (p. 14). A volunteer placement can provide the same type of positive vocational experience as a carefully constructed job trail if there is professional staff involvement. The advantages of such are described by Corthell & Tooman (1985) as providing "...the opportunity for ongoing observation of the quality of behaviors over an extended period of time....the job trail will give essential information on the impact of cognitive, executive, behavioral, and psychosocial deficits on work performance" (p. 94).

Community-based settings tend to hold more realistic expectations of client performance and behaviors. The concurrent, active involvement of professional placement specialists to: observe and evaluate on-site behaviors; provide feedback; and to assist in restructuring the work setting to maximize performance, produces a more accurate performance profile that is important to further placement planning. "The opportunity to observe the quality of the traumatically brain injured client's ongoing performance, as well as to assess their capacity to modify that behavior given feedback, are absolutely crucial in determining vocational potential and choosing job placement for traumatically brain injured clients" (Corthell & Tooman, 1985, p. 94).

Supported employment. The concept of supported employment has been around for a number of years and initially given the authority of law under the Developmental Disabilities Assistance and Bill of Rights Act in 1984. The definition and emphasis for supported employment can be found in the 12th Institute On Rehabilitation Issues document on Supported Employment (1985) and is as follows:

Supported Employment means paid work in a variety of integrated

settings, particularly regular work sites, especially designed for severely handicapped individuals, irrespective of age or vocational potential:

1. For whom competitive employment at or above minimum wages has not traditionally occurred; and

2. Who, because of their disability, need intensive, on-going post employment support to perform in a work setting." (Federal Register, 1985).

The Congressional Research Service of the Library of Congress prepared a summary in 1986 which described the qualities of supported employment and programs that utilize that model. They include the following:

- Intensive initial training of the severely vocationally handicapped person in natural work environments;

- Social integration at the work site, with non-disabled individuals who are not paid caregivers;

- Continuing intervention (support) to help the person sustain acceptable work performance and maintain employment;

- Reinforcement of job-related training as needed for job maintenance or transfer to a new job;

- Public funding of continuing support costs;

- Program administration by a non-profit agency;

- Pay rates ranging from sub-minimum rates (with proper certification) through the statutory minimum wage and above;

- Work in individual jobs, small groups (often called "enclaves"), or mobile work crews;

- Workers receiving the same benefits available to other workers;

- Ongoing support at the work site provided by a "job coach" or "employment training specialist" who performs such direct services as: job analysis, advocacy with employers, matching clients to jobs, on-the-job training, transportation and housing assistance, assisting in establishing eligibility for public income payment, ongoing support services provided at the job by a public agency which maintains the support and/or contact with the individual over time and responds to

changes in an employment situation which requires immediate attention.

Stapleton, Parente, & Bennett (1989), in preliminary research on the effectiveness of job coaching with clients who were traumatically brain injured concluded, "Job coaching did not obviate the clients' problems returning to work. However, it did minimize them. Six of the eight clients are still working. In general, we feel that job coaching is a promising employment model for head injured persons" (p.21).

Individual Placement Model. With the individual placement model, persons with traumatic brain injury are placed in regular community jobs, and support is provided at the work site as needed to insure that they will be able to learn and perform the work. The positions vary from twenty to forty hours per week and have a high degree of co-worker integration associated with them. Initially, a high level of support is provided by professional staff. As both the formal and informal behaviors that are associated with the job are learned, this support is 'faded' out and intermittent, routine follow-up contact takes its place.

Enclave Model. The enclave model usually consists of a small group of up to eight individuals with continuous supervision in a mainstream environment with varying degrees of opportunity for integration.

Mobile Work Crew. Individuals who need more supervision than can be received at an enclave, or whose conduct and behaviors are unacceptable in a more integrated environment, may be served effectively by this model. A mobile work crew is set up as a single purpose business by a service provider to create employment opportunities for a certain client group. Mobile work crews typically contain five clients and one supervisor. They tend to operate out of a vehicle rather than a facility and work on such typical jobs as janitorial, maintenance, or grounds keeping services.

Benchwork Model. The last model of supported employment to be examined is best explained in an article found in the Rehab Brief. It states that "...individuals need more supervisory attention and have behavioral problems that exceed the [mobile work] crew's ability to respond....this model shares many of the features and constraints with traditional sheltered workshops ....integration into the larger community is addressed by locating the workplaces by stores, restaurants, and other places offering integration opportunities..." (Vol. X, no. 1, p. 3).

While the various models of supported employment have successfully demonstrated wide applicability with other disability groups, it should not be viewed as a panacea for persons with traumatic brain injury and their placement needs. The crucial component of successful supported employment is that of follow-up. Follow-up is a feature of the model that can be applied to any placement opportunity for a person with traumatic brain injury.

Competitive Employment

Competitive employment is one of the placement options available to persons with traumatic brain injury. It is an important part of the array of placement choices available and can be utilized where appropriate. If the client's knowledge, skills and abilities match the position requirements, then placement should be strongly considered. Professional involvement with this level of employment should be encouraged as a way to lessen the stresses of transition. A strong professional presence initially can offer the necessary support that can fade quickly to that of a routine follow-up contact or contact on an as-needed basis.

FOLLOW-UP

Research reports indicate that a person with traumatic brain injury goes through an average of six or seven jobs postinjury before settling into one that meets their needs and is manageable. This, of course, suggests that a closed case may be only temporarily closed. If persons with traumatic brain injury are to be provided with effective and efficient services, appropriate follow-up must be maintained.

Counselors utilizing traditional approaches to vocational rehabilitation and placement would be "...tempted to consider the job completed when the client is placed in employment which appears suitable" (Gandy, Martin, Hardy & Cull, 1987, p.144). Current thinking in the rehabilitation profession is that after a client has obtained a job, a comprehensive, long-term phase begins that is of crucial importance in insuring that the employment experience is satisfying to both the client and the employer. This follow-up phase is critical for persons with head injuries. Whether a job coach is involved in a supported employment setting or the client has been placed in competitive employment, routine, periodic and ongoing contact must be built into the rehabilitation plan. This may require that counselors, who have persons with traumatic brain injury on their caseloads, should carry a reduced number of "active" cases so that they can devote the requisite time to follow-up services.

Follow-up can be defined as planned, ongoing support of a routine nature designed to assist a client in obtaining and maintaining employment. It can take many forms in providing the necessary and requisite support to accomplish these goals. However, follow-up is most successful when it is designed to acknowledge the dynamic nature of both the needs of the person with traumatic brain injury and of the employment setting. This design needs to take into account that planned follow-up contact should be proactive rather than only reactive. For example, some follow-up visits should be during periods of success so positive feed-back can be given. In other cases, needs and potential problem areas can be both identified and anticipated. Then solutions to the problem can be implemented before a crisis occurs requiring the counselor or

employer to take drastic action. Anticipating problems and visits when the counselor can compliment the client prevents the client from associating counselor visits with severe job problems.

The positive support needed by the client can begin during the interviewing process with the professional staff. They can provide support and assistance with the various aspects of the job seeking process. Placement staff should conduct an analysis of the potential job and could make recommendations for adaptation/modification of the job environment to meet certain physical or cognitive requirements. They could educate the employer and provide a degree of awareness training for the new co-workers. Placement counselors should instruct employers to call them if there are any job related problems or other problems which are adversely effecting their job performance. Unfortunately, it is all too common that this does not occur. A job coach can provide intensive, initial involvement on the job and gradually fade out their involvement. Fading out begins when both the formal and informal behaviors of the job are learned by the person with traumatic brain injury. After the initial involvement, routine contact with the employee is important as subsequent transitions, both on and off the job site, may create some problems that require professional intervention. A new supervisor, a move to a new location, or a change in the interpersonal dynamics of the worksite are some examples of changes where the reinvolvement of a job coach or professional placement person would be indicated.

The placement specialist or job coach will have to make periodic checks by telephone or by actually visiting the job site. It is obvious that this is a very labor intensive procedure but one that is necessary to provide consistent monitoring. The time frame for follow-up contacts will vary between clients and should be tailored for the individual. A good rule of thumb might be "check-ups" every week for a month, at longer intervals for at least one year and then on an as needed basis. The placement specialist or person performing the follow-up function will need to "probe for" little problems on the job. Too often the small problems are overlooked or not dealt with by the employer. The employer may then fire the person with traumatic brain injury over a seemingly insignificant problem, but they are really addressing the cumulative effect of a series of minor problems. Proactive interventions on the part of the placement specialist should anticipate this situation and act accordingly.

If the person with traumatic brain injury has performed satisfactorily and wishes to make a career move, professional support and guidance is appropriate for all the same reasons explored previously. This can be provided as part of an ongoing follow-up process.

SUMMARY

The greatest challenge facing professionals concerned with the rehabilitation

of the person with traumatic brain injury is how to facilitate successful community re-integration. Vocational rehabilitation and placement hold great promise as a means to that end. New technologies, placement models, and programs are emerging but must be given the opportunity to grow and to evolve. The unknowns of recovery profiles, functional deficits, compensatory strategies, occupational outlooks, and vocational potential must be acknowledged and factored into an equation where the greatest unknown and greatest resource is the depth of spirit of the person with traumatic brain injury whom we hope to assist.

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Section IV

UNRESOLVED ISSUES

Chapter 10

UNRESOLVED ISSUES IN THE REHABILITATION AND COMMUNITY-BASED EMPLOYMENT OF PERSONS WITH TRAUMATIC BRAIN INJURY

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Community-based employment options is a relatively novel approach in the vocational rehabilitation of persons with traumatic brain injury. Sheltered employment and work adjustment programs, provided within rehabilitation facilities, however, have generally not been well accepted by the head injured person. The widespread promotion of community-based programs with persons diagnosed as developmentally disabled or mentally ill has recently given rise to initiatives investigating the usefulness of similar community employment approaches for persons who have survived a traumatic brain injury. For both of these reasons considerable attention has been drawn to community-based employment as a desirable vocational rehabilitation strategy for traumatic brain injury survivors.

The practice of providing vocational rehabilitation services to persons who survive a traumatic brain injury is also relatively new for rehabilitation facilities and state vocational rehabilitation agencies. The increased survival rate following a severe traumatic brain injury is primarily responsible for this newly emerging disability group seeking rehabilitation. An apparent societal dilemma developed when advances in medical trauma technology made it possible for many persons who likely would have died a decade earlier to survive. These brain trauma survivors require specialized rehabilitation programs. The magnitude of their needs became apparent in several ways as they began to request services from a service delivery system which was ill equipped to understand the impact of their disability and which was financially restricted from providing all their costly but needed services.

First, the person who sustains a traumatic brain injury tends to retain their pre-injury concept of themself. They may maintain the same opinion of their abilities and personal characteristics as they did prior to the injury, regardless of the fact that they may be considerably different. It is also common for a head injured person to report that working around persons with severe disabilities is discomforting, even though they may exhibit similar physical, psychosocial, cognitive and behavioral problems. This increases the desire for integrated, community-based work on the part of the traumatic brain injury survivor, the family, and advocacy groups.

To compound the problem, vocationally useful materials available relevant to traumatic brain injury rehabilitation approaches has been rather limited. Serving persons with the unique problems which they present creates unusual challenges for most rehabilitation workers as the typical service provider has limited experience or knowledge of the disability. Knowledge of neuropsychological principals of rehabilitation in the employment sphere has developed only very recently. The lack of understanding of vocational rehabilitation processes by neuropsychologists and the lack of knowledge of brain-behavior relationships by vocational rehabilitation personnel also has served to slow the development of comprehensive vocational rehabilitation programs using the knowledge base of neuropsychology and the service

resources of vocational rehabilitation. The impact of this lack of knowledge and lack of "how to do it" approaches has been that most programs develop in a trial and error fashion.

Finally, the resulting needs among traumatically brain injured persons are likely to vary tremendously. There does not appear to be a typical pattern of vocational needs. One person who has suffered a relatively minor head injury with a brief (or no) period of unconsciousness may exhibit profound difficulties in returning to work, while another person with a moderate to severe head injury may make an adequate adjustment. Rehabilitation and return to employment depends on very complex (and poorly understood) interactions of the type of injury, age, time since injury, pre-injury skills, employment history, and a host of other variables. Unlike other disabilities, it is not possible to develop a reasonably accurate prognosis of rehabilitation needs and potential from a disability diagnosis and specialty report.

Both private and governmental funding sources are now being used to develop and demonstrate community-based employment programs throughout the nation. As these programs are being implemented, there have been increased demands to develop programs around a common language, to use standardized assessment approaches, and to include assistive and compensatory technology as tools in delivery of rehabilitation in community-based sites.

Present knowledge from neuropsychology and vocational rehabilitation and applications of that knowledge, however, as the previous chapters in this book have suggested, is in its infancy. Traumatically brain injured persons are now surviving at a dramatically increased rate from just a few years ago, and are likely to live a normal life span. It was with this background and concern for the state of art in treatment and employment of persons with traumatic brain injury that an attempt was made to identify unresolved issues of importance in their rehabilitation and community-based employment. This chapter provides a compilation of the unresolved issues identified during the Atlanta Think Tank (Thomas & Menz, 1988).

The Atlanta Think Tank

The Atlanta Think Tank was co-sponsored by the University of Wisconsin-Stout Research and Training Center and the National Head Injury Foundation on November 16, 1988, prior to the National Head Injury Foundation's annual conference in Atlanta. In conceiving the need for such a meeting, it was concluded that the state of the art on rehabilitation of persons with brain trauma was ill defined. Consensus was needed on issues to address in an upcoming national forum[1]. Three areas were identified as most critical to future program

[1]The national forum was held Feb. 27-28, 1989, at Clearwater Beach, FL.

development. Individuals were sought from various transdisciplinary professions, representatives from advocacy groups, persons actively involved in research, and leaders in program development and public policy.

The Think Tank was designed to stimulate creative thinking and problem and issue identification. A combination of panel presentations, open discussions, and small group consensus activities were used to identify issues in the three topical areas.

Nationally recognized leaders in the field presented their points of view in each respective area or served as reactors and participants in subsequent discussions. Fifteen panelists presented position papers during the morning of the Think Tank. Each presenter defined the key issues in their respective topic area, presented an overview of what was known, discussed what needed to be done to attack the issues, and attempted to be controversial in order to stimulate group discussion and interaction.

Panel presentations were followed by reactions and comments from the full Think Tank. Each participant was assigned to one of the three topic groups based on their primary interest. These groups explored the issues and problems identified in the panel presentations in the afternoon and compiled lists of issues considered important from their point of view or professional interest.

This paper documents the primary issues unique to brain injury rehabilitation and employment that the authors were able to identify from the panel presentations, papers, group notes, and tape recordings. These important and largely unresolved issues include (a) public policy issues; (b) public education and advocacy issues; (c) program authority, responsibility, and capacity issues; (d) systemic issues; and (e) model development issues. The five sets of issues are presented without reference to their criticality for the reader's consideration. They are followed by specific capacity building priorities for research and development that emerged from the Think Tank materials.

Public Policy Issues

Purpose for Special Public Policy

There is a need to acquire consensus with respect to reasons for and what would be accomplished by establishing public policy related to the rehabilitation of persons with traumatic brain injury. In all likelihood, public policy would address prevention, remedial efforts, and where public funds must be allocated to achieve those broad purposes.

Some general examples of purposes for public policy suggested by the Think Tank were the following:

- To achieve the development of valued employment opportunities in integrated settings for all persons with traumatic brain injury.

- To establish community capacities to intervene and meet the independent living and productive activity needs of persons with traumatic brain injury.

- To improve the quality of life for persons with traumatic brain injury in relation to community integration and, specifically, meaningful daily activity provided through employment.

Specific Needs to be Addressed Through Public Policy

Evidence about the range and extent of rehabilitation needs of this population from a national perspective is limited. Such evidence is essential if meaningful public policy is to be formulated and the necessary capacities to provide needed services are planned at both a national and state level. Needs assessment must take a broad view of the nature of habilitation and rehabilitation needs, of costs to serve, and of the other resources necessary to adequately address those needs. There is need to take a longer view of the needs of this population, as well. They represent a supply-side problem in economics. The numbers of traumatic brain injury survivors are consistently increasing as they are now surviving. Therefore, the impact of an increasing traumatic brain injury population size needs to be examined insofar as present and future needs related to employment, mobility, health, recreation, and aging. Traumatically brain injured persons represent a growing but underserved population with diverse rehabilitation and habilitation needs.

An extended view of needs must also take into account the real costs borne by families, by society through public funds, by private sector insurance, by non-public charitable sources, and by employers in relation to monetary and nonmonetary returns. This view must not only weigh the costs to serve persons with these injuries, but must also weigh the costs society must bear should they not be rehabilitated.

How best and equitably to meet their needs through public policy must also be considered. Pursuing categorical or disability specific programs or increased allocation for all disability relevant research, training, and services presents a dilemma for those advocating for a seemingly underserved population. Trying to achieve "separate but equal services" or queuing for a "fair-share" of limited funds and resources pose problems for legislation and development of public policy.

Legislative Focus

Legislation is needed to give focus, coordination, and needed resources for

vocational and independence relevant services, for medical and assistive technology, and for the research, development, demonstration, and personnel preparation necessary for sustaining quality services.

Public policy, and resulting legislation, may have to put (a) greater emphasis on prevention of injury at all age levels; (b) consider alternative or broadened indicators of individual productivity and valued contribution (besides traditional wage yielding work); and (c) develop capacities to address life-long rehabilitation and habilitation needs, including those associated with aging, through research, demonstration, training, and public education.

Such policy and legislation might well encourage the design and implementation of a national registry with which to document the pre-injury history, epidemiology, recovery, acute medical management, ongoing rehabilitation, and related data (e.g., cost, service patterns) of individual cases. Such a registry could provide data needed for assessing need and for identifying appropriate systems of care for extended rehabilitation service needs (e.g., community-based rehabilitation service and employment programs).

Public Education and Advocacy Issues

A significant amount of attention was given in the Think Tank to issues of public awareness and the interplay of awareness with advocacy for both public policy formulation and program development. A low level of knowledge about what this disability is and how broadly it impacts a person's life is present among the American public; including professionals and consumers alike. Advocacy issues and consequent strategies to influence public policy need to develop a more substantial knowledge base across relevant community sectors and develop coalitions to pursue policy and legislative development through these same sectors.

Public Awareness and Education

Audiences in need of education include policy makers, employers, survivors of brain trauma injuries and their families, members of the health and helping professions, and others who may potentially influence public policy. Advocacy and education efforts need to be directed toward raising public recognition and sensitivity to the impact and level of needs of these persons. Such efforts should create public awareness of the following: (a) The randomness with which these injuries can affect persons of all ages and in all segments of society; (b) the extent to which these injuries result from transportation, recreation, family abuse, and violent crimes; (c) the life-long effects which traumatic brain injury has on cognitive, social, and economic possibilities for an individual; (d) the compounding effects which traumatic brain injury has on the individual and on society; (e) how community-based options work on behalf of both the individual and society; and (f) how brain injuries can be prevented.

Advocacy in Achieving Public Policy

Where to concentrate efforts is a constant issue in any advocacy effort. Enlightenment and education is needed among the public at large, within legislatures and the executive branches, and among employers in the public and private sectors. Direct advocacy efforts are needed (a) with the general public to impact upon their socio-economic attitudes toward persons who are severely disabled; (b) among elected officials to direct the case for specific legislation based upon inequity, cost/benefits that are achieved from serving these individuals, and how existing rehabilitation systems can be used or modified to address need; and (c) within the employment sector to develop rationales for employing persons with disabilities based on labor needs and economic returns that those employment practices will promote.

A second constant issue is that of which strategies will most likely influence public policy. No single strategy or individual is likely to formulate or significantly influence public policy. Diverse strategies need to be pursued and coalitions formed in order to have maximum impact. These strategies will include public awareness, providing relevant information and data, and individual advocacy. Examples of such strategies include (a) emphasizing how benefits to society can be cost effective; (b) establishing coalitions among professional and consumer constituencies; (c) preparing balanced propositions regarding funding for services, for prevention, and for research and development; and (d) making optimal use of existing entitlements.

Greater leverage is achieved through coalitions which include relevant stakeholders who are expected to benefit by an expanded public policy such as consumers, professionals, families, advocates, employers, and public servants. Likewise, significant leverage can be achieved if strategies relate to society's long-term social needs to include all individuals, to employer labor market and productivity needs, and to general humanitarian goals and values.

Finally, effective strategies will increase impact because of common interest and needs. Such strategies increase the likelihood (a) that contributing coalitions can be formed between those who need and those who pay for services and benefits (e.g., social security, public assistance, worker's compensation, self-insured employers, private insurance) and (b) that a means is in place through which these stakeholders can communicate, negotiate, and present a unified position on broad public policy issues.

Program Authority, Responsibility, and Capacity Issues

Identifying a system with primary authority and responsibility for serving persons with traumatic brain injury is essential for consistent delivery of needed services. The responsible agents at each level must insure (a) equitable and timely access to needed services, (b) coordination of services and needed

resources, and (c) ready financial and coordinative support for individual's habilitation and rehabilitation needs. While there are various possible combinations of federal, state, and local agencies which might be able to provide coordinated programming to meet the population's needs, the present state-federal rehabilitation system seems best authorized to do so with any acceptable degree of consistency. Advocacy efforts are needed, however, to insure that liaisons with the other organizations and agencies (public and private sector) which affect the quality of public policy for the disability group are identified and established at all levels within that system.

Federal Level Responsibility

The Rehabilitation Services Administration is assigned authority and responsibility for coordinating rehabilitation programming and for basic funding provided through the states. Advocacy efforts need to be directed at (a) establishing a distinct code for traumatic brain injury on their service system in order to assure eligibility and specialization in service planning, (b) establishing cooperative agreements between various federal agencies and with relevant advocacy groups in order to reduce duplication and effectively link the efforts and resources of these other agencies to the efforts of this agency, and (c) obtaining agency commitment of resources for the development of an aggressive model to serve persons with traumatic brain injury.

State Level Responsibility

State rehabilitation agencies have the authority and responsibility to serve severely disabled persons with vocationally related needs. Goals of the program include independence and employment. Advocacy efforts need to be directed at encouraging the development of (a) registries for injury (e.g., incidence, follow-up, and coordinated treatment) in order to define and acquire needed resource; (b) necessary interagency agreements to insure their inclusion, access, and coordination of needed services and funding; (c) cooperative agreements among relevant consumer organization(s) to enlist direct support within communities; and (d) a lead agency role for the state agency in serving persons with traumatic brain injury.

Community Level Responsibility

Community-based service and employment programs need to consider the total life impact of injury and pursue life-long independence and integration goals. This means that the community level provider may have to plan for the individual in the context of their full life support and service needs and not isolate work issues from the rest of their life needs. This may also require development of community-based delivery systems which (a) coordinate housing needs, service needs, and opportunities for productive activity (including paid work); (b) provide flexibility in systems access over the individual's lifetime to

maximize their productivity and cost/benefit ratios; (c) include substantial support for the role of significant persons in their lives (e.g., family, personal care assistants) in securing and maintaining employment; and (d) address continuing contribution roles of the injured person, rather than only serving a crisis management function.

Questions of Capacity

While an integrated delivery system may be preferred, there remain significant issues with respect to whether such a goal is possible. These are questions of capacity which arise because of present interagency fragmentation, the complex of disablement which the injury imposes, present capacities of the public rehabilitation program, and the state of art in local communities to provide necessary rehabilitation services.

Interagency fragmentation (at state, federal, and local levels) is likely the paramount of these problems. Numerous organizations vie for or have partial responsibility for serving this population and limited communications exist among each of them. As a result, formal and, therefore, financial lines of collaboration are rarely accomplished. Meaningful coordination is typically unavailable and difficult to initiate. The highly complex and individual impacts which result from traumatic brain injury may prevent any single agency (medical or social service) from effectively serving the population. The variety of individual rehabilitation needs, coupled with intermittent and long-term disruption of their physical, mental, social, and vocational capacities, may outstrip the knowledge and resources of any single system.

Further, questions are raised with respect to resources and capacity of the present state and local level rehabilitation systems. The present rehabilitation system may be seriously limited in its capacity to adequately address both vocational and independence needs of significant numbers of persons with traumatic brain injury. The present skills and qualifications and experiential background of state agency personnel, its case loads, the agency's ability to coordinate services, and the fiscal resources available through the agency may, collectively, be insufficient to the level of need. The technical soundness of current supportive models, availability of meaningful community-based jobs, and the limited numbers of skilled community-based practitioners may further limit delivery of quality community level rehabilitation and employment services.

Systemic Issues

Systemic issues are largely issues related to assuring that adequate resources are available and accessible to meet needs throughout the system. Central to this is funding, particularly the funding of long-term care. Central though this issue is, it is highly interdependent (if not inextricably bound) to such other systemic issues as disability definitions and codes, how to provide continuing access to

services, disincentives to rehabilitation, and issues pertaining to equity in use of public resources.

Long-Term Funding

How to provide long-term funding to meet continuing case management, follow-along service, and assistive needs for individuals in community-based employment is a primary issue. Persons with traumatic brain injury often require use of intense services and resources in initial stages and highly variable requirements for on-job and off-job aid following placement. These needs may be life-long, intermittent, and quite different from time to time and from person to person. Needs may require long-term funding for a variety of different services directly provided to the injured person (e.g., job coaching, behavior management) and for significant others (e.g., employers, co-workers, family member), for case management, and for aids and technology to keep the person in employment and in the community.

Definitions and Disability Codes

There are needs to resolve differences between federal and state definitions and classifications of persons with traumatic brain injury. Federal law uses a functional definition, while many states use categorical definitions which include traumatic brain injury variously under "developmental," "mental health," or "cognitive" classifications. Such differences lead to conflicting eligibility requirements and difficulty in consistently accessing entitlements for federal, state, and local funds and services. In combination, a common disability code and classification in national and state data systems (and registries) could help to establish common inter-program eligibility and outcome criteria.

Mechanisms for Continuing Access

Mechanisms are needed which make it convenient for consumers, families, and significant others to access and re-access state and community level services, assistive resources, and employment. These mechanisms may include (a) open readmissions or nonclosure provisions; (b) methods for multiple-funding for services or for individuals; (c) ready access to the technology (e.g., behavior management, job modification) required to fulfill individual rehabilitation goals; and (d) involvement of the employer in planning and on the treatment team.

Disincentives to Rehabilitation

Significant disincentives to return and community integration exist for persons with these injuries. Some of the disincentives come about because of (a) the difficulty in accessing information, funding, and services between agencies; (b) fear of losing SSI/SSDI and other entitlements; (c) lack of prestige in the jobs often available; (d) community apathy and social isolation that occurs

because of the personality changes secondary to a brain trauma injury; (e) extreme economic and personal costs to family members; and (f) familial fears for the safety of the injured person.

Equity in Allocating Finite Resources

There is a need to address issues of fairness in distribution of limited resources for a population in relation to other populations with needs and to persons with differing levels of impairment and need. Equity and resource limits will require that strategies are devised which confront the issue of when diminishing returns on resource investments requires that efforts be redirected to productive, but non-work, options for consumers. The question arises; should resources be given to those with the greatest potential for achieving employment and independence, or to those who are truly the most severely disabled?

Community-Based Model Development Issues

Goals, Outcomes, and Criteria

A considerable amount of the Think Tank discussion involved individual perspectives on what meaningful delivery systems and clinical and community-based programs might look like. From such discussions, it was clear that a need exists for consensus on acceptable goals, especially for community-based programs. This is a complex of issues which includes issues of definition and language, of agreed upon criteria relevant to alternative models, the potential for program standards, and need for ecologically valid outcome measures.

These issues have multiple implications. The implications include (a) whether personal independence and integration goals are included along with employment; (b) what priority consumer empowerment and integration goals are given in planning; (c) whether integration implies physical and/or social integration and opportunity and/or personal choice in integration; (d) whether the array of options for employment includes competitive, volunteer, sheltered, and full and part-time work as acceptable options; (e) whether the goals are goals shared by, or merely promoted by, professionals and advocates for individuals with traumatic brain injury; (f) how funding is allocated; and (g) the degree to which alternate community-based models are actually comparable.

Definitions and language. Consensus is needed with regard to (a) the concept of productive activity, including work productivity, individual productivity, and socially valued productive activity and (b) functional definitions and classifications of brain trauma as it impacts on vocational and nonvocational capacities of individuals. Such conventions in language facilitate the identification of meaningful employment and work performance criteria

which have clinical relevance and of measures which have ecological validity (i.e., validity in the context in which the appraised behavior is expected to be developed or to occur).

Criteria. Both intermediate and long-term criteria are needed because of the likelihood that many persons with brain injury in community-based employment will have intense rehabilitation needs initially, with less service needs as they accommodate to the work routine. Criteria need to be developed which will provide the basis for developing (a) functional and program level indicators of benefits and impacts (e.g., individual skill gains, closure rates) for both employment and integration goals; (b) indicators for both intermediate and long-term impacts; and (c) measures which demonstrate evidence of community-family-consumer valuing of quality of an individual's contributions and achievements.

Standards. Some discussion was given to establishing outcome standards or success criteria which could be applicable across programs. While the development of standards can be difficult, it can be done once an adequate base of knowledge about programs and impacts of those programs has been established. Were standards to be developed, separate standards would likely be sought for employment and for consumer independence, empowerment, and integration.

Ecologically relevant measures. There is a need to develop and validate instrumentation for assessment of intermediate and long-term benefits of programs. Ecologically valid methods should be (a) useful in appraising the contributions and effectiveness of specific interventions (e.g., based on syndromes resulting from injury) and (b) useful in comparative appraisal of the efficacy of specialized, differential or individualistic treatment modalities, training methods, and employment strategies.

Theoretical Basis and Design of Generalizable Models

A considerable number of directions and questions critical to program development were raised during the Think Tank. Some issues included the timing of clinical interventions, the role of moderator variables, individual and group founded strategies to employment, the generalizability of acquired and residual skills, how to provide the optimal skill and behavior management interventions, disincentives and employment quality, and support needs. Clearly, some of these could be more systematically addressed were there a stronger adherence to previous medical, learning, social-psychological, and vocational research and theories. Others are likely to be pragmatic resolutions quite dependent on specific conditions.

Theoretical basis for models. Community-based models and strategies

appear to lack a theoretical basis and rely on specific behaviorally anchored strategies (e.g., behavior management strategies found useful in on-the-job training of developmentally disabled persons). Lack of a foundation in theory may preclude the evolution and broader generalization of community-based models to accommodate the unique needs of persons with specific functional impacts resulting from their traumatic brain injury.

Specific developmental research related issues. As models are developed and tested, the following considerations need to be simultaneously developed or determined:

- Vocational rehabilitation techniques and processes which should be provided prior to or in conjunction with community-based employment.

- Medical, psychological, historical, behavioral, attitudinal, residual losses, social and familial status (pre- and post-injury) predictors of employment and integration outcomes.

- Moderating variables which should be accounted for in selection decisions and which affect clinical or community-based treatments. Especially to be considered are alcohol and other substance abuse; management of medical regimes; role of secondary injuries; economic, social, and familial support; familial role in return to work; and systemic and socio-economic disincentives.

- Whether specific training (e.g., cognitive training and rehabilitation, job and employment readiness training) and sequences of services (e.g., concurrent support and pre-support to achieve readiness) improve likelihood of success.

- How individual success (initial and sustained) is promoted or affected by individual readiness, on-off job supports, behavioral management strategies, employer-employee interventions and training, residential arrangements, compensatory aids and technology, support groups, and applications of existing supported employment models.

- Functions which sheltered employment may play in relation to community-based programs.

- Procedures and instrumentation with which to (a) identify strengths and weaknesses amenable to compensatory training and (b) documentation of functional implications of assessed residual strengths, capacities, and deficits in employment success.

Syndrome basis for treatment. Syndromes are constellations of

problems or subsets of effects found among a number of persons to result from injury. They are predictable patterns of responses among individuals. Design of treatment strategies to address such patterns of capacities and deficits has been suggested as a promising direction for clinical and community-based program development and evaluation. Strategies which may prove to be effective with persons exhibiting certain syndromes or constellations of deficits may be useful in augmenting highly individualized programs. Evaluations of such treatment modalities should seek (a) to identify recognizabe syndromes and corresponding models that work with these syndromes, (b) determine the efficacy of individualized treatment strategies, (c) determine how group input and reinforcement affect treatment of traumatic brain injury, and (d) determine the role secondary losses play in such differential treatment.

Supports needed to sustain employment. Brain trauma will differently require supports which may be, depending upon the nature of trauma, required throughout the individual's life. While some forms of support might be similar to those needed by other disabilities, the pattern of on-job support provided an individual with a developmental disability is not likely to be appropriate. There are needs to determine typical (a) environmental accommodations (on and off job); (b) technology and assistive devices and strategies used; (c) follow-along services; and (d) residential, social, economic, and transportation needs which must be anticipated and met if community-based employment and integration are to succeed.

Employment training and behavior management. Several unresolved issues were suggested with respect to employment training and behavior management. Unresolved issues for training in community-based services and employment are with (a) whether it is likely that long-term job retention will occur in initial community-based jobs, (b) whether the focus of training should be on performance on a specific job or a broader class of work and interpersonal skills, and (c) the extent to which training should include opportunity to take normal risks and to fail with minimum frustration.

Unresolved issues in behavior management and adjustment provided in job settings include (a) how much pressure is appropriate to prevent plateauing and inducement of frustration levels and (b) the extent to which there is need for multiple replacement jobs to insure continued employment through behaviorally turbulent adjustment periods. Common unresolved issues in skill and behavioral training relate to the (a) theoretical basis for learning, (b) the efficacy of highly individualistic-differential strategies, and (c) transferability of learned skills (or compensatory capacities) between work and social situations.

Types of jobs in community-based employment. A pragmatic issue relates to the tendency for community-based employment practitioners to access entry-level or manual labor intense jobs. These jobs often have low prestige

value for individuals and their families and may become disincentives in that they conflict with the pre-injury self-image which brain trauma victims often retain. The manual and entry-level jobs also make demands on capacities which may be limited for many individuals, including (a) endurance; (b) flexibility (i.e., to do all parts of job); (c) capacities to respond and filter multiple stimuli; (d) ability to remember tasks and sequences of operations; and (e) productivity (time needed to complete a job).

Relevant Assessment and Vocational Planning

While effective vocational planning is somewhat dependent upon having resources and program options available to carry through such plans, the lynchpin is the quality and thoroughness of the assessments upon which the plan is based. As is evident throughout the issue analysis, there was considerable concern over the utility of information obtained from medical, neuropsychological, and vocational assessments. Considerable attention was given to the relevancy of neuropsychological and medical reporting and meaningful translation of this information into terms relevant to vocational planning.

Types and quality of data. Data which are needed from neuropsychological and vocational evaluation for effective vocational planning includes basic information on the cognitive processes including (a) attention and concentration; (b) visual processing; (c) memory; (d) reasoning and problem-solving; (e) executive functions and impairments, particularly as these capacities or deficits are relevant in achieving employment and community re-entry goals. Information relevant to individual's readiness for vocational planning includes their (a) awareness and acceptance of deficits, (b) specific functions unaffected by trauma, (c) capacities to compensate for deficits, (d) capacities to retain specific new skills and behavior, and (e) extent and specific needs requirements for support to acquire and sustain employment.

Ecological or contextual validity. Estimates of validity for functional and neuropsychological measures and assessments based upon specific job component skills, skill acquisition or reacquisition, entry-level job performance, or daily living skills criteria are needed. Problems identified included those of (a) the foundations upon which neuropsychological measures were developed and (b) the need to estimate their validity against specific behavioral indicators (e.g., ability to perform specific aspects of jobs) rather than global indicators (e.g., employment status).

Capacity Building Priorities

Specific Research and Evaluation Issues

These priorities relate to fundamental measurement issues, estimation of need and program capacity, effectiveness of contemporary practices, and evaluation of economic and individual benefits to be achieved by serving persons with traumatic brain injury in clinical and community settings.

- Obtain consensus with respect to (a) legitimacy of employment and independence goals of community-based programs, (b) what constitutes meaningful and productive activity, and (c) what are acceptable outcome criteria appropriate to evaluating the impact of community-based programs on individual and program needs.

- Determine the incidence of traumatic brain injury resulting from such sources as transportation, recreation, domestic abuse, and violent crimes and identify preventative measures and post-injury rehabilitation strategies.

- Determine incidence of traumatic brain injury among young children from such sources as transportation, recreation, domestic abuse and violent crimes and identify preventative measures and post-injury rehabilitation strategies.

- Determine the incidence, types, and magnitude of needs and likely cost to meet the needs of individuals and families including their needs for respite care.

- Determine the consequences of aging among persons with traumatic brain injury as they affect their habilitation and rehabilitation needs.

- Estimate the potential level of service capacity and the potential impact of existing rehabilitation systems and programs.

- Determine the extent to which there are syndromes resulting from injury which can be effectively identified and treated through clinical and community-based strategies or models.

- Determine the individual and program impacts, effectiveness, and cost/benefit for current community-based approaches to rehabilitation.

- Determine the extent to which networking and interactive models involving families and rehabilitation professionals affect employment and integration outcomes.

- Determine the effectiveness of pre- and post-placement therapies, supports, environmental modifications, and training.

- Determine concomitant pre- and post-employment service needs (e.g., transportation, housing, employment supports, personal assistance-training-coaching).

- Determine relative benefits (direct and indirect) and costs (monetary and non-monetary) in meeting needs.

- Estimate costs to society for not serving individuals with traumatic brain injury, including losses borne by families of survivors.

- Establish the ecological validity of instruments and measures (a) used in assessment of employment and integration relevant needs, (b) used in development and monitoring of vocational rehabilitation planning, and (c) used in evaluation research on the impacts of community-based programs on individuals served.

Specific Program Development Issues

These issues suggest the scope of concern which participants had for programs which meet the needs of persons who acquire a brain injury. They cover a wide spectrum of rehabilitation and habilitation issues. The specific priorities identified for program development included the following:

- Definitions, documentation, and classification of consequences of traumatic brain injury based on functioning and compensatory strategies and approaches.

- Contextually meaningful definitions and measures of productive activity, appropriate at different points of recovery, and which apply to community-based service and employment programs sponsored through public funds.

- Evaluation procedures which accurately assess vocationally relevant needs, capacities, and deficits and which produce information in a format appropriate to vocational planning with injured persons.

- Delivery systems to address the whole-life needs of persons with traumatic brain injury which incorporate current service systems, demonstrable program models, and uniquely devised clinical and community strategies.

- Early intervention programs and systems to address needs of children with traumatic brain injury, including their potential involvement in

employment.

- Programs which address habilitation and productivity needs of aging traumatically brain injured persons, including their potential for involvement in employment.

Specific Program Resource Issues

This set of issues is related to general needs in program development for fiscal integrity and for service coverage for those with significant need. They are broadly based and have considerable systemic importance. These issues range from the principal issue of funding to developing systems and mechanisms which increase the likelihood of timely access to services and to quality of life:

- Establish public-private sector cofunding or funding blends.
- Improve access to long-term funding at federal, state, and local levels.
- Clarify entitlement and eligibility provisions or limitation and establish mechanisms for accessing interagency-intersector funding.
- Speed up access to and delivery of vocational rehabilitation services.
- Establish mechanisms for coordination; including coordination of disability determination, eligible and entitled benefits, single point of rehabilitation entry and re-entry, case management responsibilities, and case transfer capacities (e.g., changing among funding sources or service agencies).
- Establish mechanisms to increase private sector involvement in long-term employment through inducements (e.g., pay them for long-term rehabilitation supports) or development of appropriate public policy.
- Localize responsibility among several levels of systems (existing or new agency) in both public and private sectors (for funding, programs, commitment, responsibility).
- Establish coding and classification for this disability in service system registries for identification to enable coordination of long-term funding; transfer between service agencies, and open case loads; and to establish meaningful closure criteria.
- Identify meaningful protection and advocacy responsibilities for systems.

Specific Personnel and Training Issues

Professional knowledge base. There is a lack of consensus about which knowledge and skill variables are critical for first line workers in community-based settings. This is partially due to a lack of research evidence on community-based models. It is also due to the lack of a common body of knowledge shared among professionals (least of all by consumers and employers) of the etiology and immediate consequences of brain trauma, of the long-term affects of brain trauma, and of the long-term impacts of trauma on behavior and skill capacities. As a result, no theoretical base has evolved upon which to found development of models and practices presently in use or to use to integrate the knowledge achieved through research and demonstration efforts. Three areas in need of consensus were identified.

- Consensus is needed which will help to define the fundamental knowledge which rehabilitation counselors, vocational evaluators, and community-based practitioners must have in order to work effectively with this population.

- Language, terminology, and the manner in which data from medical, neuropsychological, and vocational assessments are conveyed makes these reports difficult to use in vocational planning. Consensus on how such data might be communicated in vocationally relevant terms is needed.

- The unique contributions and participation of significant persons from the consumer's rehabilitation environment need to be defined. In particular, specific contributions and roles need to be defined for consumers, family, pre-employment professionals (e.g., medical, psychological, vocational rehabilitation counselor), post-employment professionals (e.g., job coaches, case managers, psychiatrists), employers, and co-workers.

Resource development issues. Materials on traumatic brain injury are needed which are relevant to consumers, family members, and employers, as well as to professionals and paraprofessionals. The following kinds of documentation were identified as specific resource materials which would have considerable value for training:

- Examples of effective coordinated delivery systems and reimbursement structures.

- Effective clinical and community-based models, including theoretical basis, design, definitions, criteria for appropriate referral, and outcome measures.

- Efficacy of individual and syndrome-based treatment strategies.

- Validated team interaction models for linking vocational rehabilitation counselors, neuropsychologists, and vocational evaluators in their assessment and planning.

- Models for involving family, client, employer, agency, and various professionals in collaborative case management.

Training priorities. Diverse skills are needed by personnel working with traumatically brain injured individuals. There are few professional and paraprofessionals with adequate knowledge and skills in university or state agency settings, least or all in private sector or community-based settings. Preservice and inservice training must be expanded to develop competence among those currently working with brain trauma individuals and to assure sufficient numbers of qualified personnel in related disciplines. Development of curricula which provides hands-on experiences, as well as coordination and sharing of relevant information on successful treatment strategies and models, may partially solve this need.

Vocational rehabilitation counselors, job coaches, neuropsychologists, and vocational evaluators were specially identified as in immediate need of training. Whether preservice or inservice, training should pursue the following objectives:

- Fundamental knowledge of brain behavior relationships and the affect of various types of trauma on social, family, vocational, and economic potential.

- Knowledge of relevant clinical and/or community-based strategies.

- Skills for planning individualized interventions using relevant medical, social, psychological, and vocational information.

- Skills in effective team building and interactions.

- Skills needed to help family members and coworkers to work with injured individuals.

Summary and Conclusions

As the complete list (and also the much shorter list of critical issues identified by Thomas and Menz (1990)) derived from the Think Tank are examined, two broad needs can be extracted. First there is a need for effective community-based models to be demonstrated and detailed for general dissemination. Most, if not all, of the identified critical issues addressed

different sides of a general need to define, demonstrate, and document effective community-based rehabilitation models which can be used by others as they attempt to meet the needs of people who have experienced a brain injury. In order for such models to be meaningful, they must take into account the wide individual differences among traumatic brain injury survivors and consequently the variety of potential rehabilitation needs.

Second, public policy needs to be established which can provide leadership in the development of programs of research, service, and education. Public policy at the federal, state, and local levels must be developed to guide the evolution of new programs and services and discover ways to prevent brain injury. As this chapter illustrates, much of the Think Tank discussion spoke to the need to have legislation and regulations in place which would assure that both the acute and on-going vocational rehabilitation needs of persons with traumatic brain injury are adequately addressed within their communities. Public policy must address issues related to early and ready access to medical and vocational rehabilitation for brain injured persons, and long-term funding for services in appropriate community-based settings. Public policy must also provide support for research and development of the assessment, planning, technology, and program approaches, as well as for inservice and preservice training of medical, rehabilitation, and employment personnel. Finally, an agenda to achieve such public policy should include advocates, consumers, employers, and professionals. A primary goal of public policy should be to educate both the American public and legislators as to the extent, impact, and manner of need among this growing segment of Americans with disabilities.

The development of effective community-based treatment strategies for vocational rehabilitation of persons with traumatic brain injury is difficult to say the least. The wide variations in individual consequences of traumatic brain injury and, until recently, the novelty of individuals surviving these injuries has brought consumers, advocates, and practitioners to question what it is that vocational rehabilitation is about and to search for how and what it can accomplish on their behalf. The wide range and very fundamental nature of the critical issues identified at the Atlanta Think Tank is a testimony to the infancy of knowledge of how brain trauma differently impacts upon each person and their potential for involvement in society and work following brain trauma. A broader understanding and debate of these issues must be engaged in by educators, practitioners, public policy makers, and consumers and, together, this group must strive to formulate an agenda which seriously begins to resolve the issues identified in this chapter.

REFERENCES

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APPENDIX A

Glasgow Coma Scale

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HEAD TRAUMA RESEARCH PROJECT
New York University Medical Center
Institute of Rehabilitation Medicine

Instructions for Scoring the Glasgow Coma Scale

EYE OPENING

None	E	1	Eyes always closed; not attributable to ocular swelling
To Pain		2	Eyes open in response to painful stimulus
To Speech		3	Eyes open in response to speech or shout; does not imply patient obeys command to open eyes
Spontaneous		4	Eyes open; does not imply awareness

BEST MOTOR RESPONSE
(stimuli: pressure on nail bed and supraorbital pressure)

No Response	M	1	No motor response to pain
Extension		2	Extension at elbow
Abnormal Flexion		3	Includes preceding extension, stereotyped flexion posture, extreme wrist flexion, abduction of upper arm, flexion of fingers over thumb: see administration instruction, if unsure, score as withdrawal
Withdrawal		4	Normal flexor withdrawal; no localizing attempt to remove stimulus
Localizes Pain		5	Attempt made to remove stimulus, e.g., hand moves above chin toward supraocular stimulus
Obeys Commands		6	Follows simple commands

BEST VERBAL RESPONSE

No Response	V	1	No sounds
Incomprehensible		2	Moaning, groaning, grunting; incomprehensible sounds
Inappropriate		3	Intelligible words, but not in a meaningful exchange; e.g., shouting, swearing; no meaningful conversation
Confused		4	Responds to questions in conversational manner, but responses indicate varying degrees of disorientation and confusion
Oriented		5	Normal orientation to time, place, person; appropriate conversation

Summed Glasgow Coma Scale Score = E + M + V (3 to 15)

Sum of Best Responses:
Eye Opening
Motor Response
+ Verbal Response
Summed Glasgow Coma Score

APPENDIX B

Rancho Los Amigos Head Trauma Scale

Rancho Los Amigos Hospital
Division of Neurological Sciences
Head Trauma Service

LEVELS OF COGNITIVE FUNCTIONING

I. GENERALIZED

Patient appears to be in a deep sleep and is completely unresponsive to any stimuli presented to him.

II. GENERALIZED RESPONSE

Patient reacts inconsistently and nonpurposefully to stimuli in a nonspecific manner. Responses are limited in nature and are often the same regardless of stimulus presented. Responses may be physiological changes, gross body movements and/or vocalization. Often the earliest response is to deep pain. Responses are likely to be delayed.

III. LOCALIZED RESPONSE

Patient reacts specifically but inconsistently to stimuli. Responses are directly related to the type of stimulus presented as in turning head toward a sound, focusing on an object presented. The patient may withdraw an extremity and/or vocalize when presented with a painful stimulus. He may follow simple commands in an inconsistent, delayed manner, such as closing his eyes, squeezing or extending an extremity. Once external stimulus is removed, he may lie quietly. He may also show a vague awareness of self and body by responding to discomfort by pulling at nasogastric tube or catheter or resisting restraints. He may show a bias by responding to some persons (especially family; friends) but not to others.

IV. CONFUSED-AGITATED

Patient is in a heightened state of activity with severely decreased ability to process information. He is detached from the present and responds primarily to his own internal confusion. Behavior is frequently bizarre and nonpurposeful relative to his immediate enviornment. He may cry out or scream out of proportion to stimuli even after removal, may show aggressive behavior, attempt to remove restraints or tubes or crawl out of bed in a purposeful manner. He does not, however, discriminate among persons or objects and is unable to cooperate directly with treatment efforts. Verbalization is frequently incoherent and/or inappropriate to the environment. Confabulation may be present; he may be euphoric or

hostile. Thus gross attention to enviornment is very short and selective attention is often nonexistent. Being unaware of present events, patient lacks short term recall and may be reacting to past events. He is unable to perform self-care (feeding, dressing) without maximum assistance. If not disabled physically, he may perform motor activities as in sitting, reaching and ambulating, but as part of his agitated state and not as a purposeful act or on request necessarily.

V. CONFUSED, INAPPROPRIATE NON-AGITATED

Patient appears alert and is able to respond to simple commands fairly consistently. However, with increased complexity of commands or lack of any external structure, responses are nonpurposeful, random, or at best fragmented toward any desired goal. He may show agitated behavior, but not an internal basis (as in Level IV), but rather as a result of external stimuli, and usually out of proportion to the stimulus. He has gross attention to the environment, but is highly distractable and lacks ability to focus attention to a specific task without frequent redirection back to it. With structure, he may be able to converse on a social, automatic level for short periods of time. Verbalization is often inappropriate; confabulation may be triggered by present events. His memory is severely impaired, with confusion of past and present in his reaction to ongoing activity. Patient lacks initiation of functional tasks and often shows inappropriate use of objects without external direction. He may be able to perform previously learned tasks when structured for him, but is unable to learn new information. He responds best to self, body, comfort and often family members. The patient can usually perform self-care activities with assistance and may accomplish feeding with maximum supervision. Management on the ward is often a problem if the patient is physically mobile, as he may wander off either randomly or with vague intention of "going home."

VI. CONFUSED-APPROPRIATE

Patient shows goal-directed behavior, but is dependent on external input for direction. Response to discomfort is appropriate and he is able to tolerate unpleasant stimuli (as NG tube) when need is explained. He follows simple direction consistently and shows carryover for tasks he has relearned (as self-care). He is at least supervised with old learning; unable to maximally assist for new learning with little or no carryover. Responses may be incorrect due to memory problems, but they are appropriate to the situation. They may be delayed to immediate and he shows decreased ability to process information with little or no anticipation or prediction of events. Past memories show more depth and detail than recent memory. The patient may show beginning immediate awareness of his situation by realizing he doesn't know an answer. He

no longer wanders and is consistently oriented to time and place. Selective attention to tasks and in unstructured settings, but is now functional for common daily activities (30 minutes with structure). He shows at least vague recognition of some staff, has increased awareness of self, family and basic needs (as food), again in an appropriate manner as in contrast to Level V.

VII. AUTOMATIC-APPROPRIATE

Patient appears appropriate and oriented within hospital and home settings, goes through daily routine automatically, but frequently robot-like, with minimal to absent confusion, but has shallow recall of what he has been doing. He shows increased awareness of self, body, family, foods, people and interaction in the enviornment. He has superficial awareness of, but lacks insight into his condition, demonstrates decreased judgement and problem solving and lacks realistic planning for his future. He shows carryover for new learning, but at a decreased rate. He requires at least minimal supervision for learning and for safety purposes. He is independent in self-care activities and supervised in home and community skills for safety. With structure, he is able to initiate tasks as social or recreational activities in which he now has interest. His judgement remains impaired; such that he is unable to drive a car. Pre-vocational or avocational evaluation and counseling may be indicated.

VIII. PURPOSEFUL AND APPROPRIATE

Patient is alert and oriented, is able to recall and integrate past and recent events and is aware of and responsive to his culture. He shows carryover for new learning if acceptable to him and his life role, and needs no supervision once activities are learned. Within his physical capabilities, he is independent in home and community skills, including driving. Vocational rehabilitation, to determine ability to return as a contributor to society (perhaps in a new capacity), is indicated. He may continue to show a decreased ability, relative to pre-morbid abilities, reasoning, tolerance for stress, judgement in emergencies or unusual circumstances. His social, emotional and intellectual capacities may continue to be at a decreased level for him, but are functional for society.

(Original Scale co-authored by Chris Hagen, Ph.D., Danese Malkmus, M.A., Patricia Durham, M.S., Communication Disorders Service, Rancho Los Amigos Hospital, 1972. Revised 11/15/74 by Danese Malkmus, M.A. and Kathryn Stenderup, O.T.R.)

APPENDIX C

Physical Variables Profile

PHYSICAL VARIABLES PROFILE

DIRECTIONS: This form was intended for use by personnel who will be planning rehabilitation activities. An attending physician will generally be able to address the majority of the items on this list from their knowledge of the person. In cases where a physician is unable to complete this form, a rehabilitation nurse or a medical case manager may be able to provide information. This form is intended to be used as an aid to rehabilitation planning and not as a replacement for a standard physical examination report.

Steps to Complete the Physical Variables Profile

1. Examine the list of variables and rate the degree of the problems or impairment that the variable causes. Note that this form provides for a simple means of determining the degree of limitations which exists:

   0 - **Within Normal Limits**. A variable is of no consequence, minor, is an infrequent occurrence, or the problem has been corrected by an aid or appliance such as glasses or a hearing aid. For informational purposes, the rater may wish to further indicate if the variable is at the high end (H) or low end (L) of the category "within normal limits." Note that in some cases this "H" or "L" rating will be irrelevant and unnecessary.

   1 - **Minor**. The variable is of some consequence and may conceivably affect vocational, social, or personal adjustment. As an example, the rater may wish to state that a problem or deficit exists, but it is uncertain as to whether it will cause future problems. In some cases a job may need to be modified to minimize the impact of these variables. Examples may include well controlled epilepsy, fatiguability, or problems with balance.

   2 - **Notable**. Moderate to significant consequences of these problems are expected on vocational, social, or personal adjustment. Examples may include paralysis, significant weakness, or atoxic motor qualities which are unlikely to be compensated for and which are essential to document for rehabilitation planning.

2. After completing Column A, place a checkmark in Column B which indicates the source of the data (e.g., direct observation, examination, or test results).

3. Complete Column C only if job goals are identified. Due to the fact that the job goal will often determine whether or not an impairment or limitation will cause work-related problems, this part cannot be completed unless job goals are identified. Note that space for rating two separate job goals is provided.

4. Use the comment section between each category of variables to provide additional information if necessary, preceded by the item which you are addressing (e.g., "A-6 - range of motion is restricted in upper extremities, but contractures do not exist" or "A-2 - minor right sided weakness exists but continues to improve with therapy").

The Physical Variables Profile was developed as a means of identifying medical, sensory, and motor problems which may impact on the rehabilitation process of persons who have sustained a brain trauma injury. The variables listed on this form are not extensive nor are they inclusive of the wide range of functional limitations which may occur following a brain injury. This list, however, was developed from a research project which identified the types of functional limitations which are most common and which tend to cause most of the problems in planning a return to the community and to employment.

BEST COPY AVAILABLE

PHYSICAL VARIABLES PROFILE

Date: _____

Person: _____
Primary
Job Goal: _____
Secondary
Job Goal: _____
Name &
Job Title: _____

I. PHYSICAL VARIABLES	A. IMPAIRMENT OR FUNCTIONAL LIMITATIONS Circle the Degree of Impairment or Functional Limitation Which Exists			B. INFORMATION SOURCE				C. LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL Is it Likely That the Impairment or Limitations Will Cause Work Problems?					
	Within Normal Limits 0	Minor Problem 1	Significant Problem 2 (Circle One)	Direct Observation	Statement from Credible Source	Written Records or Reports	Clinical Examination or Testing	Job Goal #1 Yes	Job Goal #1 No	Job Goal #1 ?	Job Goal #2 Yes	Job Goal #2 No	Job Goal #2 ?
A. Motor Strength and Coordination													
1. Ambulation	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Lifting/Weakness	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Fatigueability	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Fine dexterity and motor coordination (ataxia)	0	1	2	___	___	___	___	___	___	___	___	___	___
5. Gross dexterity and coordination (ataxia)	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Range of motion/contractures	0	1	2	___	___	___	___	___	___	___	___	___	___
7. Facial muscle control	0	1	2	___	___	___	___	___	___	___	___	___	___
8. Paralysis/palsy	0	1	2	___	___	___	___	___	___	___	___	___	___
COMMENTS:													
B. Sensory Problems													
1. Vision system (double vision, depth perception, etc.)	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Hearing	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Pain, pressure, and hot and cold perceptions	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Smell and taste	0	1	2	___	___	___	___	___	___	___	___	___	___
5. Other sensory problems	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Balance/dizziness or vertigo	0	1	2	___	___	___	___	___	___	___	___	___	___
7. Headaches	0	1	2	___	___	___	___	___	___	___	___	___	___
8. Numbness	0	1	2	___	___	___	___	___	___	___	___	___	___
COMMENTS:													

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I. PHYSICAL VARIABLES (Continued)	A. IMPAIRMENT OR FUNCTIONAL LIMITATIONS. Circle the Degree of Impairment or Functional Limitation Which Exists. Within Normal Limits 0	Minor Problem 1	Notable Problem 2 (Circle One)	B. INFORMATION SOURCE. Direct Observation	Statement from Credible Source	Written Records or Reports	Clinical Examination or Testing	C. LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL. Is it Likely That the Impairment or Limitations Will Cause Work Problems? Job Goal #1 Yes	No	?	Job Goal #2 Yes	No	?
C. Other Medical Issues													
1. Diabetes	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Cardiovascular problems	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Respiration/Breathing problems	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Skin conditions	0	1	2	___	___	___	___	___	___	___	___	___	___
5. Muscular-skeletal problems	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Hydrocephalus	0	1	2	___	___	___	___	___	___	___	___	___	___
7. Epilepsy	0	1	2	___	___	___	___	___	___	___	___	___	___

COMMENTS:

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APPENDIX D

Neuropsychological Variables Profile

NEUROPSYCHOLOGICAL VARIABLES PROFILE

DIRECTIONS: This form was intended for use by personnel who will be planning rehabilitation activities. The neuropsychologist should be able to address the majority of the items on this list from their knowledge of the person. In cases where a neuropsychologist is unable to complete this form, a rehabilitation specialist with access to neuropsychological information may be able to document the information requested.

Steps to Complete the Neuropsychological Variables Profile

1. Examine the list of variables and rate the degree of the problems or impairment that the variable causes. Note that this form provides for a simple means of determining the degree of limitations which exists:

   0 - **Within Normal Limits.** A variable is of no consequence, minor, is an infrequent occurrence, or the problem has been corrected by an aid or appliance such as glasses or a hearing aid. For informational purposes, the rater may wish to further indicate if the variable is at the high end (H) or low end (L) of the category "within normal limits." Note that in some cases this "H" or "L" rating will be irrelevant and unnecessary.

   1 - **Minor.** The variable is of some consequence and may conceivably affect vocational, social, or personal adjustment. As an example, the rater may wish to alert the rehabilitation counselor that a problem or deficit exists, but it is questionable as to whether it will cause future problems. In some cases jobs may need to be modified to minimize problems.

   2 - **Notable.** Moderate to significant consequences are expected on vocational, social, or personal adjustment. Examples may include gross motor skill problems which are unlikely to be compensated.

2. After completing Column A, place a checkmark in Column B which indicates the source of the data (e.g., direct observation, examination, test results).

3. Complete Column C only if job goals are identified. Due to the fact that the job goal will often determine whether or not an impairment or limitation will cause work-related problems, this part cannot be completed unless job goals are identified. Note that space for rating two separate job goals is provided.

4. Use the comment section between each category of variables to provide additional information if necessary, preceded by the item which you are addressing (e.g., "A-6 - range of motion is restricted in upper extremities, but contractures do not exist" or "A-2 - minor right sided weakness exists but continues to improve with therapy").

The Neuropsychological Variables Profile was developed as a means of identifying several areas of functioning which may impact on the rehabilitation process of persons who have sustained a brain trauma injury. The variables listed on this form are not inclusive of all of the variables which may occur following a brain injury. This list, however, was developed from a research project which identified the types of variables which are most common and which tend to cause most of the problems in planning a return to the community and to employment following a brain injury. This form is intended to be used as an aid to rehabilitation planning and not as a replacement for a neuropsychological evaluation report.

BEST COPY AVAILABLE

NEUROPSYCHOLOGICAL VARIABLES PROFILE

Date: _____

Person: _____
Primary Job Goal: _____
Secondary Job Goal: _____
Rater & Job Title: _____

III. NEUROPSYCHOLOGICAL VARIABLES	A. IMPAIRMENT OR FUNCTIONAL LIMITATIONS Circle the Degree of Impairment or Functional Limitation Which Exists			B. INFORMATION SOURCE				C. LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL Is it Likely That the Impairment or Limitations Will Cause Work Problems?					
								Job Goal #1			Job Goal #2		
	Within Normal Limits 0	Minor Problem 1	Notable Problem 2	Direct Observation	Statement From Credible Source	Written Records or Reports	Clinical Examination or Testing	Yes	No	?	Yes	No	?
	(Circle One)												
A. General Cognitive Functions													
1. Alertness and vigilance	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Attention and concentration	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Perseveration in speech or motor activities	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Maintenance of problem solving set	0	1	2	___	___	___	___	___	___	___	___	___	___
5. General fund of information	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Abstraction skills	0	1	2	___	___	___	___	___	___	___	___	___	___
7. Arithmetic abilities	0	1	2	___	___	___	___	___	___	___	___	___	___
8. Hemi-spatial neglect	0	1	2	___	___	___	___	___	___	___	___	___	___
9. Insight	0	1	2	___	___	___	___	___	___	___	___	___	___
10. Decision making ability	0	1	2	___	___	___	___	___	___	___	___	___	___
11. Judgement	0	1	2	___	___	___	___	___	___	___	___	___	___
12. Cognitive flexibility	0	1	2	___	___	___	___	___	___	___	___	___	___
13. Information processing speed	0	1	2	___	___	___	___	___	___	___	___	___	___
14. Planning and carrying out activities	0	1	2	___	___	___	___	___	___	___	___	___	___
15. Self-regulation (ability to shift course	0	1	2	___	___	___	___	___	___	___	___	___	___
16. Awareness of obvious limitations or deficits	0	1	2	___	___	___	___	___	___	___	___	___	___
17. Ability to learn new information	0	1	2	___	___	___	___	___	___	___	___	___	___

COMMENTS:

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III. NEUROPSYCHOLOGICAL VARIABLES (Continued)	A IMPAIRMENT OR FUNCTIONAL LIMITATIONS Circle the Degree of Impairment or Functional Limitation Which Exists Within Normal Limits 0	Minor Problem 1	Notable Problem 2	B INFORMATION SOURCE Direct Observation	Statement from Credible Source	Written Records or Reports	Clinical Examination or Testing	C LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL Is it Likely That the Impairment or Limitations Will Cause Work Problems? Job Goal #1 Yes	No	?	Job Goal #2 Yes	No	?
	(Circle One)												
B. Memory (including immediate and delayed as appropriate)													
1. Auditory/verbal	0	1	2										
2. Visual/nonverbal	0	1	2										
3. Procedural/skill	0	1	2										
4. Memory for designs or figures	0	1	2										
5. Remote (historical)	0	1	2										
6. Prospective (future)	0	1	2										
COMMENTS:													
C. Communication Skills													
1. Understand verbal commands	0	1	2										
2. Writing skills	0	1	2										
3. Stays on topic when speaking	0	1	2										
4. Spontaneity and appropriateness of speech	0	1	2										
5. Tangential/circumstantial speech	0	1	2										
6. Intelligibility of speech	0	1	2										
7. Voice volume	0	1	2										
8. Vocabulary	0	1	2										
COMMENTS:													

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III. NEUROPSYCHOLOGICAL VARIABLES (Continued)	A: IMPAIRMENT OR FUNCTIONAL LIMITATIONS Circle the Degree of Impairment or Functional Limitation Which Exists			B: INFORMATION SOURCE				C: LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL Is it Likely That the Impairment or Limitations Will Cause Work Problems?					
								Job Goal #1			Job Goal #2		
	Within Normal Limits 0	Minor Problem 1	Notable Problem 2 (Circle One)	Direct Observation	Statement from Credible Source	Written Records or Reports	Clinical Examination or Testing	Yes	No	?	Yes	No	?
D. Psychomotor Skills													
1. Simple assembly skills	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Fine motor control	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Gross motor control	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Simple reaction time	0	1	2	___	___	___	___	___	___	___	___	___	___
5. Simple drawing and assembly skills	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Visual-spatial skills	0	1	2	___	___	___	___	___	___	___	___	___	___
COMMENTS:													

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III. NEUROPSYCHOLOGICAL VARIABLES (Continued)	A: IMPAIRMENT OR FUNCTIONAL LIMITATIONS. Circle the Degree of Impairment or Functional Limitation Which Exists			B: INFORMATION SOURCE				C: LIKELIHOOD OF WORK RELATED PROBLEMS IN AREA OF JOB GOAL. Is it Likely That the Impairment or Limitations Will Cause Work Problems?					
								Job Goal #1			Job Goal #2		
	Within Normal Limits 0	Minor Problem 1	Notable Problem 2	Direct Observation	Statement From Credible Source	Written Records or Reports	Clinical Examination or Testing	Yes	No	?	Yes	No	?
		(Circle One)											
E. Mental Health Issues													
1. Depression	0	1	2	___	___	___	___	___	___	___	___	___	___
2. Anxiety or panic states	0	1	2	___	___	___	___	___	___	___	___	___	___
3. Hypomanic or hyperactive	0	1	2	___	___	___	___	___	___	___	___	___	___
4. Suspiciousness or paranoid	0	1	2	___	___	___	___	___	___	___	___	___	___
5. Delusions	0	1	2	___	___	___	___	___	___	___	___	___	___
6. Auditory hallucinations	0	1	2	___	___	___	___	___	___	___	___	___	___
7. Visual hallucinations	0	1	2	___	___	___	___	___	___	___	___	___	___
8. Emotionally labile (mood swings	0	1	2	___	___	___	___	___	___	___	___	___	___
9. Behavioral discontrol	0	1	2	___	___	___	___	___	___	___	___	___	___
10. Anti-social tendencies	0	1	2	___	___	___	___	___	___	___	___	___	___
11. Egocentric, self-centered, or childish	0	1	2	___	___	___	___	___	___	___	___	___	___
12. Disinhibition	0	1	2	___	___	___	___	___	___	___	___	___	___
13. Conceptual disorganization (tangential disconnected or confused thoughts processes)	0	1	2	___	___	___	___	___	___	___	___	___	___
14. Unusual content of thought	0	1	2	___	___	___	___	___	___	___	___	___	___
COMMENTS:													

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